

**The Effect of a Mindfulness-Based Stress Reduction
Programme on Adjustment to Breast Cancer**

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“This is the great work of awareness;
it removes obstacles and releases energies by understanding
the nature of life and mind.
Intelligence is the door to freedom and alert attention is the
mother of intelligence.”

Nisargadatta Maharaj
from “I am that”.

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Abstract

Objectives: The aim of this study was to evaluate the effectiveness of a Mindfulness-Based Stress Reduction Programme (MBSR) on psychological adjustment to breast cancer. It was hypothesised that engagement in the MBSR intervention would lead to more adaptive coping strategies and increase mindfulness relative to controls. It was also hypothesised that the MBSR intervention would be associated with lower levels of distress.

Design & Method: A sample of 59 breast cancer patients were randomly assigned to either an MBSR group or a waiting list control group. The MBSR intervention consisted of six weekly group sessions, each of ninety minutes duration, together with home based practice. Participants completed the measures of mindfulness (Mindfulness Attention Awareness Scale), coping strategies (Mental Adjustment to Cancer and Coping Orientations to Problems Experienced scales) and distress (Profile of Mood States) at baseline, post-intervention and at three month follow-up.

Results: The MBSR group demonstrated significant reductions in distress scores, post-intervention relative to the control group. These reductions in distress were evident on all of the subscales (tension, depression, anger, vigour, fatigue and confusion). Improvements in the MBSR group's distress scores continued beyond the intervention, with lower levels of distress observed at follow-up than post-intervention. The MBSR group also demonstrated significant improvements in mindfulness scores compared to the control group. There were no significant differences between the MBSR and control groups on any of the measures of coping strategy.

Conclusions: The MBSR intervention appeared effective in decreasing distress and increasing mindfulness. These improvements continued beyond the intervention, suggesting that they were incorporated into individuals' lifestyles rather than a temporary effect of the intervention. Further research is needed to confirm the longer-term effects of MBSR and to determine processes which may mediate its effects.

Chapter 1: Introduction

1.1 Breast Cancer

1.1.1 Incidence and Prevalence

Cancer is a major cause of morbidity and mortality throughout the world and disrupts life on many levels (Scheier & Carver, 2001). It is estimated that about 2 per cent of people (1.2 million people) in the UK are living with cancer at any one time. Breast cancer is the most common type of cancer in women. Overall, about 2.9 per cent of women in Scotland are living with cancer, of which 1.2 per cent are living with breast cancer (NHS ISD, 2007). Survival for breast cancer patients has increased from 60 per cent for those diagnosed in 1977-1981 to 77 per cent in 1997-2001. This improvement is likely to be due to a combination of new treatments, earlier diagnosis using the Scottish Breast Screening Programme and improved delivery of care for patients.

1.1.2 Psychological Consequences

It has been suggested that a diagnosis of cancer elicits greater distress than any other diagnosis, regardless of prognosis (National Cancer Institute, 1997). There are many psychological consequences following a diagnosis of cancer, including depression, anxiety and anger (Shapiro et al., 2001). In addition, having breast cancer is associated with feelings of helplessness and loss of control (Watson et al., 1991). This is likely to have an impact on how effectively a person can actively engage in their own healing and recovery process.

In the context of cancer, distress has been defined as “a multifactorial unpleasant emotional experience of a psychological (cognitive, behavioural, emotional), social, and/or spiritual nature that interferes with the ability to cope effectively with cancer, its physical symptoms and its treatment” (Standards of Care and Management of Distress Panel, 1999). Distress varies along a continuum, ranging from sadness and fear to depression and anxiety.

Weisman & Worden (1976) initially described the “existential plight” experienced by patients which occurred during the first one hundred days following a diagnosis of cancer. The distress caused can affect every area of life, including body image, social relationships, and physical symptoms. This experience can be so distressing that some patients meet criteria for a mental illness such as anxiety, depression or post-traumatic stress disorder. Meta-analysis indicates that up to 46% of cancer patients suffer from depression and up to 49% suffer from anxiety disorders (Van't Spijker et al., 1997). Unrelieved psychological distress has been associated with increased symptom burden, greater disability, increased use of medical resources, reduced quality of life and poorer medical outcome (Fawzy et al., 1995).

Lack of psychological support for cancer patients is a recognised deficit in care despite evidence of the benefits of psychosocial interventions (Fawzy et al., 1995). The Policy Framework for Commissioning Cancer Services (Calman & Hine, 1995) recommends the provision of psychological support as an integral part of cancer care.

1.2 Adjustment to Cancer

Prospective studies have provided a relatively consistent picture of the course of adjustment to breast cancer. Psychological distress tends to be highest nearer diagnosis and then declines as time progresses (Carver et al., 1993). The steepest drop in distress usually occurs within the first three months post diagnosis and surgery. However a minority of patients continue to experience high levels of distress many months or years after diagnosis. There is consistent evidence that risk factors such as younger age and having a lack of emotional and social support are associated with poorer psychological adjustment (National Breast Cancer Centre, 2003). There are also certain aspects of disease and treatment which are likely to result in higher levels of distress, such as poorer prognosis, treatment side effects and at the end of treatment.

The process of adjustment has been studied in relation to five broad categories: disease characteristics, patient characteristics, social relationships and interpersonal resources, cognitive appraisals and coping methods (Compas et al., 2002). This study is concerned with the latter category, coping methods.

1.2.1 Coping

Coping usually refers to the specific thoughts and behaviours a person uses to reduce the stressfulness of a challenge. However, it is often a loosely used term and has been variously defined. A widely recognised definition of coping is 'constantly changing cognitive and behavioural efforts to manage specific and external and/or internal demands that are appraised as taxing or exceeding the resources of the person' (Lazarus & Folkman, 1984).

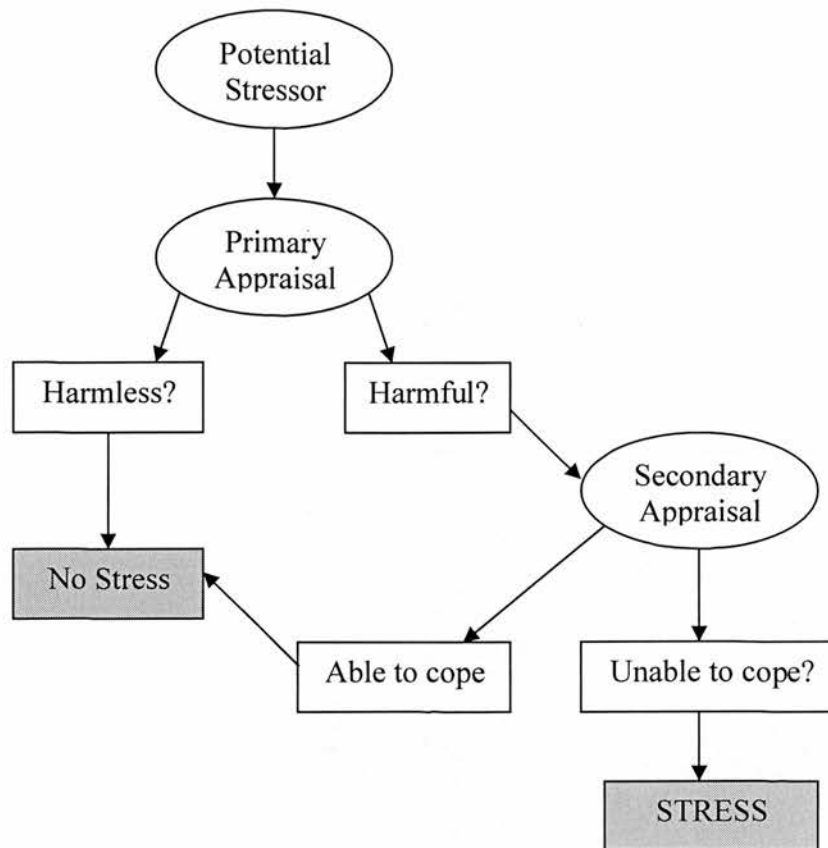


Figure 1: Model of stress and coping (Lazarus & Folkman, 1984)

(Modified from Myers et al., 2004)

Lazarus & Folkman (1984) viewed coping as a psychological mechanism for dealing with external stress. Thus, coping is an attempt to change a stressor or to make a response to a stressful situation. A stress response is elicited if a situation is appraised as being stressful. This transactional model of stress and coping is illustrated in Figure 1 above. According to this model, an individual initially appraises the event itself, termed ‘primary appraisal’. If a situation is perceived as harmful, an individual then appraises themselves, termed ‘secondary appraisal’. This involves an individual evaluating the costs and benefits of their coping strategies. According to this model, the coping response should aim at

reducing the level of stress. However, the level of stress experienced is directly related to the relationship of demands and available resources which, in turn, is determined by the relationship between the primary and secondary appraisal. As situations change, they are continually re-appraised and the coping behaviour changes in light of this re-appraisal. Thus, individuals with a diagnosis of breast cancer may experience varying levels of distress depending on their perception of the demands of the situation and their resources to cope with it.

Coping style, otherwise known as dispositional coping, refers to the more frequent, longer term style of coping used across a variety of life situations. Among the most frequently researched coping styles are: internal versus external control, optimism versus pessimism, monitoring versus blunting and approach versus avoidance (Livneh, 2000).

Coping strategies, otherwise known as situational coping, are the more specific behaviours, thoughts and perceptions that are a result of the person's coping style which are employed in an attempt to maintain equilibrium when faced with a stressful event (Rowland, 1989). As this study is addressing coping with a specific event, namely a diagnosis of breast cancer, it is concerned principally with coping strategies.

However, following the initial shock and disbelief that usually occurs at the time of diagnosis, patients go through a longer-term adaptation during which time they are likely to use a variety of coping styles and strategies. In fact, a common criticism of the literature is the assumption that coping with cancer is a single unitary event. Folkman & Lazarus (1980) suggested that patients use a large repertoire of behaviours to cope flexibly with

various threats of the disease, rather than adhering rigidly to a specific coping style. In accordance with this, a retrospective study identifying patterns of coping in cancer found that participants coped in multiple ways with the stressful aspects of cancer (Dunkel-Schetter et al., 1992).

A further criticism of the literature is the tendency to discuss coping in evaluative terms, such as successful or unsuccessful coping. This can be particularly problematic as it assumes certain coping responses will result in good or bad outcomes. It also suggests a one-way causal link between coping and health but in reality cause and effect cannot be distinguished easily from one another. However, there is a growing amount of evidence that there are a range of coping responses which can be used to deal with varying aspects of a stressful situation.

It is recognised that there is limited consensus between the majority of authors as to which responses constitute a coping style or a coping strategy and there is certainly much overlap between them. However, for the purpose of this study the term ‘coping strategy’ will be used to delineate the coping responses employed.

1.2.2 Coping strategies

This study aims to look at six specific coping strategies in relation to a diagnosis of breast cancer: fighting spirit, helplessness-hopelessness, anxious preoccupation, acceptance, problem-focused (actively engaging with the stressor) and emotion-focused (avoidant coping) strategies. These coping strategies will be outlined in more detail in the following sections.

1.2.2.1 Fighting spirit

Fighting spirit is described as accepting the diagnosis of cancer while optimistically challenging and recovering from cancer (Watson et al., 1988). It has been found to be inversely related to levels of anxiety and depression (Watson et al., 1994; Schnoll et al., 1998) and psychological distress (Classen et al., 1996). It has also been shown to be positively related to active cognitive coping and optimism (Nelson et al., 1989). There is also some evidence that patients who adopt a fighting spirit live longer after a diagnosis of breast cancer (Moorey & Greer, 1989).

1.2.2.2 Helplessness-Hopelessness

Helplessness-hopelessness is a type of passive behavioural disengagement by giving up hope and willingness to combat cancer. The use of this coping strategy has been associated with increased anxiety and depression (Parle et al., 1996; Watson et al., 1991; Watson et al., 1994; Schnoll et al., 1998), increased emotional distress (Carver et al., 1993) and poorer general psychosocial adjustment (Heim et al., 1997). It has also been linked to an increased rate in mortality (Greer et al., 1979). However, Watson et al. (1999) found that helplessness-hopelessness predicted recurrence of cancer when high and low scores were compared, but not when it was the main coping style. There have been many inconsistent findings in the literature and several studies have had methodological weaknesses, such as failing to control for confounding variables. The area of coping strategies and mortality rates remains a contentious issue. See Pettigrew et al. (2002) for a detailed review of this literature.

1.2.2.3 Anxious Preoccupation

Anxious preoccupation refers to being constantly preoccupied with cancer, frequently seeking reassurance and having concerns that any pain experienced is evidence of recurrence. This coping strategy has been associated with higher levels of depression and anxiety and a lower quality of life (Schnoll et al., 1998). It has also been associated with worse emotional well-being (Nordin & Glimelius, 1998) though this was with a sample of gastrointestinal cancer patients rather than breast cancer patients.

1.2.2.4 Acceptance

The literature has yielded contrasting findings regarding the association between acceptance of the reality of a diagnosis of cancer and psychological functioning which is likely to be due to the different definitions of acceptance used. Acceptance of the reality of a cancer diagnosis has been linked to lower psychosocial distress (Carver et al., 1993; Stanton et al., 2002). Both studies also demonstrated that active acceptance at diagnosis predicted more positive adjustment across time. Yet, it has also been associated with higher short-term mood disturbance and state anxiety (Watson et al., 1984), increased anxiety and depression (Parle et al., 1996), increased distress and decreased feelings of well-being (Miller et al., 1996). However, these latter findings are in relation to stoic acceptance which was described as acknowledging the diagnosis while ignoring the illness as far as possible (Greer et al., 1979). As this description of acceptance has an avoidant aspect to it, it may not be surprising that these studies were associated with an increase in distress. In contrast, both Carver's (1993) and Stanton's (2002) studies used a different measure which defined acceptance as accepting the fact that the stressful event has

occurred and is real and has no avoidant aspect to it. This study will use the same measure of acceptance which is the COPE scale (Carver et al., 1989).

1.2.2.5 Problem-focused versus emotion focused coping

There are many overlapping schemes in the literature to classify coping which usually involve two broad categories. Categories referred to in the literature include confronting versus palliating strategies, approach versus avoidance and engagement versus disengagement. For the purpose of this study however, the terminology problem focused (used to define active coping) and emotion focused (used to define avoidant coping) will be used in accordance with Folkman & Lazarus' Model of Stress and Coping (Lazarus & Folkman, 1984) shown in Figure 1.

According to this model there are two common types of coping strategies; problem-focused and emotion-focused. Problem-focused coping involves dealing with the problem that is causing the stress or finding out more about it. This type of coping is only likely to be employed if the individual perceives that either the problem or the resources they have to cope with it are changeable, and that they are able to bring about such change. In contrast, emotion-focused coping deals with the emotional feelings caused by the stressful challenge. This type of coping is more likely to come into existence when the individual has little or no control over the stressful situation. Research on coping has generally found that problem-focused coping is related to better adjustment than emotion-focused coping (Aldwin, 1994).

However, the literature on coping with breast cancer has typically addressed conflicting views of active, problem-solving coping versus denial and avoidant coping. Some researchers have suggested that avoidant coping facilitates adjustment. Greer (1991) found that denial following treatment was associated with a better disease outcome up to 15 years post-diagnosis. In addition, Glans & Lerman (1992) argued that as patients have less control during treatment, avoidance would allow them to cope with any side effects. Yet, in contrast Stanton & Snider (1993) suggest that denial may prevent effective decision making and may itself demand a certain level of effort. These authors concluded that even brief avoidance may be maladaptive when the stressor is severe and potentially chronic. However, there is not necessarily a cause and effect relationship between avoidant coping and distress. Rather avoidant coping is likely to be a manifestation of distress which may also exacerbate levels of distress experienced, particularly during the already stressful time of a cancer diagnosis.

There is a consistent difficulty in the literature of measuring and defining avoidant coping. Some of the measures used are: the Coping Strategies Inventory (CSI; Tobin et al., 1989) which measures problem avoidance (Epping-Jordan et al., 1999); the Coping Responses Inventory (CRI; Moos, 1988) which comprises subscales such as cognitive avoidance, resigned acceptance and emotional discharge (McCaul et al., 1999; Hack & Degner, 2004); the Ways of Coping Questionnaire (WOC; Lazarus & Folkman, 1984) which measures cognitive and behavioural escape-avoidance (Stanton & Snider, 1993); the Mental Adjustment to Cancer Scale (MAC; Watson et al., 1988) which has a single item measure of avoidance 'I don't really believe I had cancer' (Greer et al., 1990; Watson et al., 1999); the Coping Orientation to Problems Experienced (COPE; Carver et al., 1989)

which measures denial and has three subscales (denial, mental disengagement and behavioural disengagement) which can be amalgamated to yield a measure of avoidance (Carver et al., 1993; Stanton et al., 2002). As is evident, avoidance tendencies vary widely, from denying the reality of the diagnosis or the impact it will have to distraction from thoughts and feelings associated with the distress.

There have been a number of published studies on the association between breast cancer and avoidant coping. Meyerowitz (1983) retrospectively studied breast cancer patients and found that cancer specific denial was associated with lower distress. Friedman et al. (1989) found that avoidant coping was related to greater distress. There have also been five prospective studies which reported similar findings. Carver et al. (1993) found that women who reported using acceptance as a coping strategy were less distressed than women who reported using denial. In accordance with this, Stanton & Snider (1993) found that cognitive avoidant coping was a strong predictor of high distress. Two further studies found greater avoidant coping predicted greater distress (McCaul et al., 1999) and avoidance oriented coping predicted greater fear of cancer recurrence (Stanton et al., 2002). A more recent study also found that avoidance based coping responses were significantly associated with increased psychological distress (Hack & Degner, 2004).

1.2.2.6 Summary of coping literature

Although findings are not entirely consistent, research has demonstrated that coping strategies directed toward active engagement are related to more positive adjustment and strategies directed toward avoidance are associated with greater distress in cancer patients (Osowiecki & Compas, 1998; Stanton et al., 2000). Coping strategies involving active

approaches toward the stressor, such as problem-focused coping, active acceptance and fighting spirit are associated with better adjustment. Conversely, worse adjustment has been associated with coping strategies which involve avoidance, helpless-hopelessness and anxious preoccupation.

1.3 Psychological interventions for breast cancer

Many psychosocial interventions have been developed to help alleviate distress or improve the quality of life of cancer patients. These include psychoeducation, emotional support, cognitive behaviour therapy (CBT), psychotherapy and existential support. All of these treatment approaches have shown beneficial effects on emotional adjustment and treatment, and disease related symptoms such as nausea and pain. A literature review of psychosocial interventions in cancer care concluded that interventions can help patients improve their mood, cope better with distress and can help reduce the adverse effects of disease and treatment while enhancing quality of life (Fawzy, 1999).

The majority of research has been in the areas of CBT and Supportive-Expressive Therapy. Cognitive-Behavioural Therapy groups have been shown to enhance emotional well-being (Edgar et al., 2001; Moorey et al., 1998) and reduce anxiety (Gruber et al., 1993) and depression (Antoni et al., 2001) in women with breast cancer. Supportive-Expressive Therapy groups have been found to lead to an improvement in confrontative coping strategies and an improvement in well-being (Goodwin et al., 2001; Spiegel et al., 1999) and a significant reduction in pain (Spiegel et al., 1981).

Despite all this evidence, a methodologically rigorous review concluded that there is no strong evidence for the effectiveness of psychosocial interventions for cancer patients (Newell et al., 2002). In addition, no specific psychological intervention for breast cancer has met the criteria to be considered an “empirically supported” treatment. A recent Cochrane review of psychosocial interventions for women with metastatic breast cancer concluded that “there is insufficient evidence to advocate that group psychological therapies should be made available to all women diagnosed with metastatic breast cancer (as)...benefits...are only evident for some of the psychological outcomes and in the short term” (Cochrane Collaboration, 2007).

A systematic review of surveys in 13 countries estimated that between 7-64% of cancer patients had tried complementary therapy (Ernst & Cassileth, 1998), suggesting that cancer patients have an interest in complementary and mind-body therapies. Estimates have suggested that up to 41% of breast cancer patients have used relaxation/meditation techniques (Jacobson & Verret, 2001). Mindfulness meditation is one of many mind-body therapies with a growing evidence base with cancer patients. As this study is concerned with mindfulness, the intervention and the evidence base will be discussed further in the following section.

1.4 Mindfulness

Mindfulness meditation has been described as ‘paying attention in a particular way: on purpose, in the present moment and non-judgmentally’ (Kabat-Zinn, 1994) and as a ‘journey of self-development, self-discovery, learning, and healing’ (Kabat-Zinn, 1990). It is simply being aware of what is going on, as it is arising, connecting deeply and

directly with this and relating to it with acceptance. The cornerstone of mindfulness is the breath which is used as an anchor for attention and allows focus to be centred on the ever present rhythm of the breath to promote awareness, calmness and clarity.

The skill of being mindful is cultivated through the practice of meditation by deliberately taking time to practice bringing awareness to the present moment in a non-judgmental manner. The habitual tendency for unawareness or 'automatic pilot' to dominate the mind, clouding the present moment with preoccupations and preconceptions based on past experiences, brings the potential for health damaging risks. Meditation practice helps develop the skill of taking the mind out of 'automatic pilot' into present-moment reality, while non-judgmental acceptance shifts the focus of the mind from analysis into a wider perspective. One of the leading practitioners in the field of mindfulness meditation succinctly summarises this concept:

'We may never quite be where we actually are, never quite touch the fullness of our possibilities. Instead, we lock ourselves into a personal fiction that we already know who we are, that we know where we are and where we are going, that we know what is happening – all the while remaining enshrouded in thoughts, fantasies and impulses, mostly about the past and about the future' (Kabat-Zinn, 1994, p. xiii).

Rather than judge an experience as good or bad, mindfulness accepts all personal experiences, including thoughts, sensations and emotions, as fleeting moments that continually rise and pass away in consciousness. In this way, it can become evident that it is the way that one relates to the thoughts that creates a lot of the stress experienced.

Mindfulness can short circuit the fight or flight stress reaction, allowing a response to a situation rather than automatically reacting to it on the basis of past experiences. The majority of people who practice mindfulness regularly report lasting physical and psychological benefits, including an enhanced ability to relax, increased energy and enthusiasm for life, greater self-confidence and an improved ability to cope with stress in both short and long-term situations (Kabat-Zinn 1990, 1996a, 2003; Santorelli, 1999; Segal, et al., 2002).

Mindfulness has its roots in Buddhism which aims to understand the origins and cessation of suffering. However, mindfulness is taught independent of its religious or cultural traditions, thus it is potentially accessible and applicable to all (Bishop et al., 2004; Kabat-Zinn, 2003). While meditation was introduced to Western culture in the 1960s (Kabat-Zinn, 2003), it was not until 1979 that Kabat-Zinn, a scientist, writer and meditation teacher, developed Mindfulness Based Stress Reduction (MBSR).

1.4.1 Attitudinal Foundations of Mindfulness Practice

There are seven attitudinal factors which constitute the essence of mindfulness practice. They are to be consciously cultivated when practicing mindfulness and together they form the foundation upon which a strong meditative practice can be built. These attitudes are outlined in Table 1.1.

Table 1.1: The Seven Attitudinal Foundations of Mindfulness

Non-Judging	Mindfulness is cultivated by assuming a stance of impartial witness to experiences. This requires awareness of the constant stream of evaluative and judging thoughts and learning to step back from them. With a non-judging mind, things become neither good nor bad but simply present or absent.
Patience	Patience demonstrates an acceptance that things have their own schedule for unfolding, rather than expecting to be able to calm the mind or stop the thoughts. The mind has a mind of its own and patience allows for observing the unfolding of the mind and body over time.
Beginner's Mind	In order to be able to see the richness of the present moment, it helps to cultivate a mind that is willing to see everything as if for the very first time. With beginner's mind, the joys of the world become new again, like children, freed from old expectations based on past experiences.
Trust	It is far better to trust in feelings and intuition than to get caught up in the authority of experts. If at anytime something does not feel right, it is important to pay attention, examine the feelings and trust in intuition and internal wisdom.
Non-Striving	Meditation has no goal or destination in mind but rather with a mind towards simply being, not doing. There is no goal other than to be conscious of the present moment just as it is.
Acceptance	Acceptance involves seeing things as they actually are in the present. Acceptance allows for the cessation of struggling to change things which are beyond control and is the first step in any genuine process of change. Only with acceptance can the mind become free.
Letting Go	Letting go, also known as non-attachment, is fundamental to the mindfulness meditation practice. The mind tends to want to hold on to some thoughts and push others away. With letting go, the tendency to elevate some parts of experience and reject others is put aside. It is simply letting an experience be what it is, accepting things as they are without judging.

1.4.2 Mindfulness Based Approaches

Mindfulness based approaches are an integration of ancient understandings and the practice of mindfulness with current understanding and knowledge. There are five main

approaches that have been developed in recent years. Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) are the two main approaches that are based on mindfulness. The other three, Dialectical Behaviour Therapy (DBT), Acceptance and Commitment Therapy (ACT) and Relapse Prevention (RP) incorporate mindfulness into their treatment programmes rather than being based on it. There is growing evidence for the effectiveness of them. The UK National Institute of Clinical Excellence (NICE) has recently endorsed MBCT as an effective treatment for prevention of relapse. For a review of these approaches see Baer (2003). A brief overview of MBSR, the approach used in this study, will be outlined in the following section. This approach was chosen as there is a growing evidence base which has demonstrated its effectiveness with cancer patients (Specia et al., 2000; Carlson et al., 2003; Shapiro et al., 2003; Tacon et al., 2004).

1.4.2.1 Mindfulness Based Stress Reduction (MBSR)

MBSR is a structured group based programme which usually consists of eight weekly 2 hour sessions, with 1 session being a day long retreat. Mindfulness meditation is practised for 45 minutes daily at home. It includes two types of practice, termed formal and informal practice. There are three core formal practices taught: the body scan, sitting meditation and moving meditations (e.g. yoga). Informal practice refers to conscious efforts to bring this moment-to-moment non-judgmental awareness into all aspects of daily life (Kabat-Zinn, 1996a). Thus, the experience of relating to what arises in an open, accepting way within the practice becomes a possibility in everyday life. The programme also involves information about the psychophysiology of stress. The central aim is to systematically develop the skill of being present with internal experience (body sensation,

thoughts, and mood) and with external experience (interactions with others, actions in the world) and the interplay between these two (Kabat-Zinn, 1996b). MBSR has been widely researched and the evidence base (which will be reviewed in subsequent sections) is rapidly growing. The empirical literature on the effectiveness of MBSR contains many methodological weaknesses but evidence suggests that it may help to improve psychological functioning (Baer, 2003).

1.4.3 Applicability of MBSR to cancer

Several features of mindfulness practice are relevant to those facing life-altering circumstances associated with cancer. A fundamental aspect of MBSR is the here-and-now orientation. Worries about the past, perhaps concerning the causation of cancer, or concerns about the uncertainty of the future can contribute to an already exceptionally stressful event. Speca and colleagues (2006) suggest that MBSR can provide “a relatively conflict-free sphere from within which the nature of disturbing thoughts and emotions can be examined, understood and integrated”. In addition, by adopting an accepting attitude, patients are freed from a constant battle of trying to control the uncontrollable. As mindfulness encourages acceptance of things just as they are, without any preconceptions or expectations based on past experiences, a range of possibilities intrinsic in each moment of life can become apparent.

Through learning about the stress response cycle, patients can learn how to moderate their arousal levels which can help them manage treatment related symptoms such as nausea and pain which are exacerbated by anxiety (Mundy, DuHamel & Montgomery, 2003). Focusing awareness on physical sensations during sitting meditation and the body scan

technique can help patients to experience the changing nature of sensations. This can help make unpleasant sensations more tolerable and less overwhelming. It also redirects attention away from labeling or judging the sensation, for example worrying that pain may be related to cancer progression. The technique of focusing on breath awareness often leads to appreciation of full abdominal breathing and the breath can become a familiar internal focal point for attention during times of intense emotion such as awaiting treatment or test results.

The practice of mindfulness can result in the appreciation that change and impermanence are inevitable in our lives which can help reduce the suffering associated with a diagnosis of cancer and face the reality that life will never return to “normality”. It is a useful skill that patients can learn and use throughout the continuum of care and their lives to reduce stress, promote relaxation and alleviate physical discomfort and pain.

1.5 Evidence Base for MBSR

1.5.1 Clinical Populations

Although MBSR was originally developed as a generic intervention, it is now being researched and used to treat a wide range of stress and pain disorders and chronic diseases. For example, research has investigated the use of MBSR in treating chronic pain (Kabat-Zinn et al., 1985), anxiety (Miller et al., 1995; Tacon et al., 2003), depression (Segal et al., 2002), HIV (Robinson et al., 2003) and fibromyalgia (Weissbecker et al., 2002) all with large and significant overall improvements in physical and psychological status. Since this early research, there has been a strong surge of developments evaluating MBSR in a wide range of settings, including cancer populations.

1.5.2 Oncology Populations

The recent increase in the number of MBSR studies has inspired four general narrative reviews (Bishop, 2002, Baer, 2003, Proulx, 2003 and Praissman, 2008) and a meta-analysis (Grossman et al., 2004) which all support the efficacy of MBSR in heterogeneous groups of patients with medical illnesses. In addition, four recent reviews have provided a summary of the MBSR literature specifically with oncology patients (Mackenzie et al., 2005, Smith et al., 2005, Ott et al., 2006 and Matchim et al., 2007) all advocating benefits in mood, sleep, stress and immune function. Table 1.2 summarises empirical studies which have evaluated the use of MBSR with oncology populations, some of which have been outlined in the aforementioned reviews.

Table 1.2 Empirical Studies of MBSR within Oncology

Study	Pub	Participants	MBSR Group	Research Design	Control Group	Outcome
Speca et al (2000)	P	90 cancer outpatients heterogeneous in type and stage of cancer	7 weekly 90-min sessions	Between-group randomised controlled trial	WL	↓ distress ↓ stress
Carlson et al (2001)	P	54 cancer outpatients heterogeneous in type and stage of cancer	7 weekly 90-min sessions	Six month pre-post intervention follow-up (Speca et al (2000))	No	↓ distress ↓ stress maintained after 6 month follow-up
Herbert et al (2001)	P	157 breast cancer patients	15 weekly sessions	Randomised controlled trial	Nutrition education (NEP) and usual care	No change v ↓ body mass after 4 month follow-up (NEP)
Saxe et al (2001)	P	10 prostate cancer patients and partners	Nutrition and MBSR group; 12 weekly 3-4 hr sessions	One-group pre and post-test	No	↓ PSA ↓ weight
Brown & Ryan (2003)	P	41 breast and prostate cancer patients	8 weekly 90-min sessions + 3-hr retreat	One-group pre and post-test	No	↓ mood ↓ stress
Carlson et al (2003)	P	42 breast and prostate cancer patients	8 weekly 90-min sessions + 3-hr retreat	One-group pre and post-test	No	↑ QoL ↑ cytokine (immune system) ↓ stress

Shapiro et al (2003)	P	63 breast cancer patients	6 weekly 2-hr sessions and 6-hr retreat	Between-group randomised controlled trial	Free Choice	↑ sleep quality but no significant improvement in sleep
Tacon et al (2004)	P	27 breast cancer patients	8 weekly 90-min sessions	One-group pre and post-test	No	↓ stress ↓ state anxiety ↓ hh, ap, loc
Bauer-Wu et al (2004)	A	20 leukaemia patients	Twice-weekly individual sessions	Unknown recruitment and sampling	No	↓ relaxation ↓ pain
Moscoso et al (2004)	A	34 heterogeneous cancer patients	4 weekly 1-hr sessions	Participants self selected intervention or control gp	Support group	↓ anxiety maintained after 3 month follow-up
Tacon et al (2005)	P	30 breast cancer patients	8 weekly 90-min sessions	One-group pre and post-test	No	↓ state anxiety ↓ hh, ap
Carlson et al (2007)	P	59 breast and prostate cancer patients	8 weekly 90-min sessions + 3-hr retreat	One year pre-post intervention follow-up (Carlson et al., 2003)	No	↓ stress and cortisol levels maintained at 1-yr follow-up
Garland et al (2007)	P	104 heterogeneous cancer patients	8 weekly 90 min sessions + 3-hr retreat	Participants self selected intervention or control gp	HA group	↓ anxiety, anger, stress and distress levels

Pub = publication status (P = Published, A = Abstract); PSA = prostate-specific antigen; WL = waiting list; QoL = quality of life; hh, ap, loc = coping styles helplessness-hopelessness, anxious preoccupation, locus of control; HA = healing through the creative arts group

1.5.2 (a) MBSR Studies with Heterogeneous Groups of Cancer Participants

1.5.2 (a.1) Randomised Controlled Trials

Speca et al. (2000) assessed the effects of participation in MBSR on mood disturbance and symptoms of stress in a convenience sample of 109 breast and prostate cancer patients. Patients were randomised to either an MBSR group or a waiting list control group. Ninety patients completed the study. Compared with the control group, participants who completed the MBSR intervention had a significant reduction in total mood disturbance (65%) and symptoms of stress (31%). This study was an important initial step in the study of MBSR with oncology patients.

Results from follow-up analyses were reported in Carlson et al. (2001). Data from all participants were combined (with the waiting list control subsequently completing the intervention) and 54 participants from the previous study completed the 6-month follow-up. This longitudinal, repeated measures design demonstrated a significant reduction in mood disturbance and stress symptoms post-intervention. The authors claimed that improvements were maintained 6-months after completion of the MBSR intervention, but the changes were not statistically significant. In addition, it is possible that the 36 participants who did not complete follow-up data did not sustain any benefit.

1.5.2 (a.2) Uncontrolled Studies

Carlson et al. (2003) investigated relationships between an MBSR programme and immune function in 59 breast and prostate cancer patients. Significant improvements were seen in overall quality of life, symptoms of stress and sleep quality, but no significant changes were found with regard to immune function. However, changes in the

participants' immune profiles were thought to be consistent with a shift away from a depressive to a healthy immune function. Additional results were published from the same sample of patients the following year (Carlson et al., 2004). However, this study focused on neuroendocrine function. No significant changes in hormone levels were found but interesting patterns were observed such as higher melatonin levels immediately following meditation practice. Methodological limitations included a lack of control group and multiple statistical testing.

Brown & Ryan (2003) studied the effects of an MBSR intervention with 41 breast and prostate cancer patients in the development of the Mindful Attention Awareness Scale (MAAS). No significant differences in mood, stress symptoms or quality of life were found, but an increase in MAAS score post-intervention was found to be significantly predictive of a decrease in mood and stress scores. This suggested that becoming more mindful was associated with a reduction in distress and stress symptoms. Despite not being designed to examine the efficacy of MBSR, this study lacked a control group and details of the intervention were not provided.

Carlson et al. (2007) investigated the effects of MBSR on psychological, immune, endocrine and blood pressure outcomes in 59 breast and prostate cancer patients. The group had significantly reduced stress symptoms after the MBSR intervention and this reduction was maintained over a year of follow-up. No significant changes were seen in mood disturbance scores. Participation was also associated with enhanced quality of life, altered cortisol and immune patterns consistent with reduced stress and mood disturbance and decreased blood pressure.

Garland et al. (2007) compared the effects of MBSR with a healing through the arts (HA) intervention. A heterogeneous sample of cancer patients were recruited (the majority had breast cancer) and self selected which group they wished to attend. Sixty participants attended the MBSR group and 44 attended the HA group. Participants in the MBSR group showed more improvement in anxiety, anger, stress, mood disturbance, post-traumatic growth and spirituality than those in the HA group. It was concluded that MBSR may be more helpful than HA for enhancing stress reduction in cancer patients. This study was one of the first to explore issues of post-traumatic growth and spirituality in cancer patients, in addition to comparing MBSR with another intervention. However, there was no randomisation to either group as participants self selected which group they would like to attend and the MBSR group was of longer duration which may have contributed to the significant findings.

1.5.2 (b) MBSR Studies with Breast Cancer Participants

1.5.2 (b.1) Randomised Controlled Trials

Herbert et al. (2001) investigated the efficacy of MBSR in relation to nutritional outcomes with breast cancer patients. Participants were randomised to one of three groups: usual supportive care (UC), a group based nutrition education programme (NEP) or an MBSR group. While the MBSR group did not experience significant improvements in any of the outcome variables, the NEP group experienced a significant reduction in total fat and body mass at four months post intervention. This is not surprising given that the MBSR group did not receive formal instruction in nutrition unlike the NEP group. Measures of

psychological functioning were used but the findings were not reported, presumably as nutrition was the principal focus of the study.

Shapiro et al. (2003) randomised 63 breast cancer patients into an MBSR group or a “free choice” control group (FC). Participants in the FC group were allowed to pick their own stress management technique, such as having a bath or speaking to a friend. They found that both the MBSR and FC groups were associated with significant improvements in sleep quality post-intervention, but neither were associated with significant improvements in sleep efficiency (defined as ‘a ratio of the time asleep divided by the total time in bed from the time the individual intended to sleep until the final awakening’). The authors concluded that MBSR was a promising intervention for breast cancer patients who had stress related sleep disturbance, but also that self-selected stress reducing activities can be helpful as they are likely to be more personalized and thus may encourage adherence. However, the between group differences in distress scores at baseline weakened the methodological rigour of this randomised controlled trial.

1.5.2 (b.2) Uncontrolled Studies

Tacon et al. (2004) investigated the effectiveness of an MBSR programme on stress, state anxiety, health locus of control and mental adjustment to cancer in 27 breast cancer patients. The group was heterogeneous in terms of treatment and time since diagnosis, ranging from less than one year to five years. Mental adjustment to cancer was assessed using the Mental Adjustment to Cancer scale (MAC; Watson et al., 1988). Measures were administered at pre and post-intervention, however, only adherence was assessed at three month follow-up. The MBSR intervention was reduced to 1.5 hours for 8 weeks to assist

the stamina of the patients. Significant reductions were documented in pre- to post-stress, state anxiety, helplessness-hopelessness, anxious preoccupation and health locus of control. However, these findings were based on a small sample size and no comparison group. It was concluded that adjustment to cancer after participation in a MBSR programme warranted further investigation.

In a subsequent study, Tacon et al. (2005) investigated the effects of state anxiety, differences in coping tendencies and mental adjustment to cancer in 30 breast cancer patients. In this sample, time since diagnosis ranged from less than one year to sixteen years. As with their earlier study, the intervention was reduced to 1.5 hours for 8 weeks and the MAC scale was used to measure mental adjustment to cancer. However, in this study an additional measure was used to assess coping styles, the Problem-Focused Styles of Coping scale (PF-SOC; Heppner et al., 1995). Significant reductions were documented in anxiety, reactive and suppressive coping and helplessness-hopelessness and anxious preoccupation. Fighting spirit and fatalism were found to have changed in a positive direction but the changes were not significant. Both studies by Tacon and colleagues provided initial support for the application of MBSR to patients struggling to adjust to the threat of cancer. However, in the absence of a control group, it is not possible to draw firm conclusions with regard to the efficacy of the MBSR intervention.

1.6 Summary and Purpose of Study

Although the use of MBSR with cancer patients is sparse, there is a growing body of evidence to suggest that it does hold promise as a highly effective psychosocial intervention. However, several studies evaluating the effects of MBSR within oncology

populations have significant methodological weaknesses that make it difficult to draw strong conclusions. The majority of studies used a pre-post test design and no control group. Despite most of them reporting statistically significant results, they did not control for the passage of time or placebo effects. Hence randomised clinical trials are needed to clarify whether observed effects are due to MBSR or confounding variables (Chambless & Hollon, 1998).

Mental adjustment to having cancer, such as having a fighting spirit or sense of helplessness, are important psychosocial factors that have only recently begun to be investigated among cancer patients in a mindfulness-based intervention. However, the psychosocial factors that have been investigated in breast cancer are still limited and there is a clear need for further research in this area using more rigorous research designs (Matchim et al., 2007). In addition, there has been a lack of homogeneous populations (much of the cancer research combines patients with different types of cancer) and there has been little uptake of MBSR in cancer settings in the UK with no known randomised controlled trials having been undertaken.

1.7 Research Aims and Hypotheses

The aim of this study is to evaluate the effectiveness of an MBSR programme on psychological factors that have only begun to be preliminarily investigated in breast cancer patients. Hypotheses for this study are:

1. Engagement in the Mindfulness-Based Stress Reduction programme will reduce (a) avoidance, (b) helpless-hopeless and (c) anxious preoccupation responses to breast cancer compared to a control group.
2. Engagement in the Mindfulness-Based Stress Reduction programme will increase (a) mindfulness and active approaches to (b) problem focused coping, (c) fighting spirit and (d) acceptance in breast cancer outpatients compared to a control group.
3. Engagement in the Mindfulness-Based Stress Reduction programme will be associated with lower levels of distress compared to a control group.

1.7.1 Measures of constructs in hypotheses (outlined in more detail in Methods):

- i/ Mindfulness will be measured using the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003).
- ii/ Fighting spirit, helpless-hopeless and anxious preoccupation responses will be measured using the Mental Adjustment to Cancer Scale (MAC; Watson et al., 1988).
- iii/ Acceptance, problem focused and avoidance coping will be measured using the Coping Orientation to Problems Experienced (COPE; Carver et al., 1989).
- iv/ Distress will be measured using the Profile of Mood States (POMS; McNair et al., 1971).

Chapter 2: Methodology

2.1 Design

A randomised controlled design was used. A sample of eligible breast cancer patients were enrolled after giving informed consent and were randomly assigned to either an intervention group (Mindfulness-Based Stress Reduction programme) or a waiting-list control group. The purpose of the design was to investigate the effectiveness of a Mindfulness-Based Stress Reduction Programme on psychological adjustment to breast cancer. All participants completed self report questionnaire measures at three time intervals; baseline, end of treatment and three months post treatment.

2.2 Participants

A database of 238 women diagnosed with breast cancer within the past eighteen months was screened. Seventy-three participants were excluded based on the exclusion criteria. One hundred and sixty-five participants met the inclusion criteria and were invited to enroll in the study and 68 (41%) agreed. Of the 68 who opted into the study, 9 dropped out (see Appendix 1 for flowchart). Demographics of participants in the MBSR group and the control group are presented in Table 3.1 in the Results section.

2.2.1 Inclusion and exclusion criteria

The inclusion criteria for participants were as follows: female, with a diagnosis of breast cancer without distant metastases within the past twelve months, aged 18 years or older at the time of diagnosis, living in the community in the Fife region and able to give written consent. All participants were unpaid volunteers. Individuals who had a diagnosis of

breast cancer with distant metastases ($n= 27$), had advanced stage or terminal cancer ($n= 11$) and individuals with significant co-morbidity, for example dementia or psychosis ($n= 18$) were excluded from the study. Participants were also excluded if the nurses felt they were not physically able to attend the groups ($n= 9$) and 6 had died. Other reasons for excluding participants included moving house ($n= 1$) and contracting MRSA ($n= 1$).

2.3 Measures

All participants were asked to complete a demographic questionnaire at baseline which was when they opted into the study (appendix 2). They were also asked to complete self report questionnaires on three occasions, at pre-intervention (baseline), immediately after the programme (post-intervention) and three months post treatment (follow-up). These were;

- Mental Adjustment to Cancer Scale (MAC; Watson et al. 1988). (appendix 3)
- The Coping Orientation to Problems Experienced (COPE; Carver et al. 1989) (appendix 4)
- The Profile of Mood States (POMS; McNair et al. 1971) (appendix 5)
- The Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) (appendix 6)

2.3.1 Demographic Questionnaire (appendix 2)

Participants were asked to complete a questionnaire regarding demographic information (age, marital status, level of education attained, occupation and living arrangements) and medical information (time since their diagnosis and treatment).

2.3.2 Mental Adjustment to Cancer Scale (MAC; Watson et al. 1988) (appendix 3)

This brief 40-item questionnaire assesses psychological adjustment to the diagnosis of cancer in five dimensions:

- fighting spirit - whether the patient has an optimistic attitude and actively seeks information about cancer
- helplessness or hopelessness – whether the patient has an attitude of loss of control and hopelessness toward cancer
- anxious preoccupation – whether the patient has a highly anxious preoccupation with cancer
- fatalism-stoic acceptance – whether the patient has a passive, stoic acceptance of cancer
- avoidance-denial – whether the patient has an active rejection of any evidence regarding cancer

Items are rated on a Likert scale ranging from definitely does not apply to me (1) to definitely applies to me (4). Separate scores are calculated for each subscale. A higher number on each of the five subscales indicates main coping style. This measure has been independently validated and acceptable psychometric properties have been reported and

replicated (Watson et al., 1998). It was found to have highly significant correlations with the HADS anxiety and depression subscale scores (Watson et al., 1988) and the POMS (Schwartz et al., 1992) which provides concurrent validity for the scale. As the single-item avoidance subscale of the MAC has been repeatedly shown to be psychometrically weak (Grassi et al., 1993), it was not used in the current study.

2.3.3 The Coping Orientation to Problems Experienced (COPE; Carver et al. 1989) (appendix 4)

The COPE is a 60 item inventory which measures 15 active or avoidant coping strategies: active coping, planning, seeking instrumental social support, seeking emotional social support, suppression of competing activities, turning to religion, positive reinterpretation and growth, restraint coping, acceptance, focus on and venting of emotions, denial, mental disengagement, behavioural disengagement, alcohol/drug use and humour.

Participants are asked to indicate the extent to which they make use of each coping response when they experience stressful events on a Likert scale ranging from “I usually don’t do this at all” (1) to “I usually do this a lot” (4). Separate scores for each of the subscales are computed. A higher number indicates main coping strategy employed. The scale can be used to measure situational (responses to a specific stressor) or dispositional coping (typical responses to stressors). As this study involves coping with a specific stressor, namely a diagnosis of breast cancer, the situational version was used which requires participants to think about their diagnosis when completing the measure rather than any stressful event.

The COPE has demonstrated adequate psychometric properties (Carver et al., 1989) and construct and predictive validity (Carver et al., 1993). Internal consistency of the scales was found to be acceptably high with the exception of the mental disengagement scale. Carver et al. (1989) concluded that the mental disengagement scale comprises a number of disparate items and is less likely to be internally consistent. Stanton et al. (2002) combined the mental disengagement, behavioural disengagement and denial scales to provide a measure of avoidant coping following a breast cancer diagnosis and found that this composite scale had high internal consistency. The current study used the same composite measure of avoidant coping in order to make direct comparisons to Stanton's study (Stanton et al., 2002). It was decided to use this scale as it defines a broad measure of avoidance and also contains a measure of acceptance. The COPE has been widely used with cancer populations (Carver et al., 1993; Stanton et al., 2002).

2.3.4 The Profile of Mood States (POMS; McNair et al. 1971) (appendix 5)

The POMS is a 65 item instrument which assesses mood disturbance using six affective states: tension-anxiety, depression-dejection, anger-hostility, vigour-activity, fatigue-inertia and confusion-bewilderment.

Participants were asked to rate items in terms of how they have been feeling during the past week on a Likert scale ranging from not at all (1) to extremely (5). With the exception of vigour-activity, a higher number indicates the presence and severity of different moods. It has been widely used in cancer groups (Cassileth et al., 1985; Carver et al., 1993; Carlson & Brown, 2005). Good validity, reliability and sensitivity have been demonstrated and norms have been provided for cancer patients (McNair et al., 1971; Cassileth et al.,

1985). Internal consistency for the subscales was 0.90 or above and test-retest reliability ranged from 0.65 for vigour to 0.74 for depression.

2.3.5 The Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

(appendix 6)

The MAAS is a 15 item instrument that measures people's tendency to be mindful of moment to moment experience. It measures the frequency of mindful states in day-to-day life on a 6 point Likert scale ranging from 1 (almost always) to 6 (almost never). Based on a mean of all items, a higher score indicates greater mindfulness.

The MAAS was found to have good internal consistency and construct and criterion validity in cancer populations (Carlson & Brown, 2005). It has also been shown to relate to various aspects of well-being and to how effectively people deal with stressful life events (Brown & Ryan, 2003).

2.4 Ethical Approval

Ethical approval was granted for this study by the Fife and Forth Valley Research Ethics Committee on April 2007 (appendix 7). In addition, approval was given by the Fife Research and Development department (appendix 8).

The main ethical considerations for this study were potential distress to participants, elevated scores of anxiety and depression, confidentiality and informed consent. Each of these issues were considered and addressed to ensure that this study was carried out to the highest ethical standards expected by both the University of Edinburgh and the British

Psychological Society code of conduct. Further details about each of these issues are highlighted in the procedure section below (section 2.5).

2.5 Procedure

This section contains information about how participants were contacted and the procedures that were used with participants.

2.5.1 Implementation of Research Protocol

Before beginning recruitment, the researcher requested and received permission to involve the breast care nurses in the recruitment of patients from the Director of Nursing, Midwifery, Therapies and Rehabilitation and the Directorate Nurse Manager (see appendix 9).

2.5.1.1 Breast Cancer Service

Participants were identified via the breast cancer service based at Queen Margaret Hospital, Dunfermline. The service provides breast care throughout Fife which has a population of approximately 350,000. The service database suggests that approximately 150-180 females are diagnosed annually with breast cancer. These patients are offered diagnoses, multidisciplinary team planning, surgery and chemotherapy on site with radiotherapy being provided at the cancer centre in Edinburgh. At the time of recruitment there were three breast care nurses in post.

2.5.1.2 Recruitment

The breast care nurses recruited newly diagnosed patients into the study by giving out a participant information sheet (appendix 10) to those who met the inclusion criteria. In addition, patients were identified using the breast care service database and a patient information sheet was posted to those patients who met the inclusion criteria with a covering letter (appendix 11) from the nurses explaining the nature of the study.

Potential participants were given a stamped addressed envelope and asked to send a return slip indicating their willingness to participate in the study. Each participant who opted into the study was then contacted by the chief investigator (LM) and given more information about the study and asked to complete a written consent form (appendix 12) and five baseline questionnaires. Individuals who completed the forms were then randomly allocated to either the MBSR group (group A) or a waiting list control group (group B).

2.5.1.3 Randomisation

To ensure each participant had an equal chance of being assigned to either group, participants were given an individual identification number using computer generated sequences of random numbers (stattrek.com). These numbers were then entered into a computer package to generate a random number table consisting of either A (MBSR group) or B (control group).

2.5.1.4 MBSR group

Participants randomly allocated to the MBSR group were sent a letter (appendix 13) inviting them to attend their preferred group (either in Kirkcaldy or Dunfermline) with a list of dates for each session.

2.5.1.5 Waiting list Control Group

Participants randomly allocated to the control group were sent a letter (appendix 14) informing them that they would be offered the opportunity to participate in the Mindfulness Based Stress Reduction programme at the end of the study if results indicated that it was effective. They were asked to complete the questionnaires at the same time intervals as the MBSR group (appendix 15).

All participants were thanked for their participation and informed that they could obtain a summary of the findings by contacting the researcher at the end of Summer 2008.

2.5.2. Potential distress to participants

It was considered that patients meeting and sharing experiences within the group may increase concerns amongst some patients. It was likely that for most patients this would be a positive experience, however to reduce the potential for difficulties and increase the homogeneity of the sample, patients with advanced stage or terminal cancer were not recruited.

It was ensured that all participants understood the nature and purpose of the study that they were taking part in, as well as being fully aware that their participation was voluntary

and that they could withdraw at any time without explanation. All potential participants were given adequate information regarding the purpose and nature of the study and were encouraged to contact the chief investigator if they were unsure about the process of taking part or if they have any questions about the research. It was emphasised that choosing not to participate in the study would not influence their normal patient care in any way.

2.5.3 Elevated scores of emotional distress

It was possible that participants could have clinical levels of anxiety or depression which was not sufficiently treated by the mindfulness intervention offered. Procedures were put in place so that any such individuals could be offered 1-1 sessions within Clinical Psychology if deemed appropriate. It was also made clear to the participants that the chief investigator was available to offer advice and support either directly or by telephone contact at any time during the study or could direct participants to appropriate professional support should they wish or need it.

2.5.4 Confidentiality

The confidential nature of participating was emphasised on the information sheet each participant was given. All consent forms containing individual's names, addresses and identification numbers were stored in a locked cabinet in the Clinical Psychology Department. Individual identification numbers were used to label questionnaires to ensure anonymity. The numbered questionnaires were stored separately from information containing personal details. No identifiable information was entered onto a computer database, therefore ensuring strict confidentiality.

2.5.5 Informed consent

All participants were required to provide written, informed consent prior to participating in this study. It was important that participants understood the nature and purpose of the study they were taking part in, as well as being fully aware that their participation was voluntary and that they could withdraw at any time, without explanation.

2.6 Intervention

2.6.1 Structure

Those in the intervention group were invited to participate in a six week Mindfulness-Based Stress Reduction (MBSR) programme. The MBSR programme consisted of 6 weekly 1.5 hour group sessions. The standard Mindfulness programme developed by Kabat-Zinn (8 weeks of 2 hour meetings) has been successfully adapted to six and seven weeks of 1.5 and 2 hour sessions in previous research (Speca et al, 2000; Shapiro et al, 2003) to accommodate the needs and stamina of cancer patients.

Given the geographical spread of Fife and the likelihood of child care and work commitments, to facilitate attendance two groups were held at the Maggie's Centre in Kirkcaldy (Central Fife) on Tuesday afternoons and two groups were held at the breast care service (West Fife) on Monday evenings.

2.6.2 Facilitator experience

The facilitator for the current study had eight years experience practicing mindfulness based techniques, such as relaxation and yoga, and had six years of clinical experience

running groups within NHS settings, particularly stress reduction related groups. The co-facilitator for the Maggie's group was a Clinical Nurse Specialist trained in psychological therapy and ran several of the Maggie's groups, such as the 'living with less stress' course. The co-facilitator for the Dunfermline group was a Clinical Psychologist who had extensive experience working in health settings and group work. Both of the co-facilitators had no formal training but had a personal interest in mindfulness.

2.6.3 Components

The intervention consisted of three primary components:

1. education about relaxation, meditation and the mind–body connection.
2. practice of formal meditation techniques during the group meetings and home–based practice.
3. problem solving, practical day–to–day applications of mindfulness and supportive interaction between group members.

There were three basic mindfulness meditative practices:

1. The body scan – a gradual sweeping of attention through the body from feet to head observing any sensations in the different regions of the body.
2. Hatha yoga – mindful movement involving stretches and postures that strengthen, relax and increase flexibility of the musculoskeletal system and body.
3. Sitting meditation – mindful attention of the breath, body sensations, thoughts and emotions to create a non-judging awareness.

2.6.4 Content

To ensure the yoga postures were suitable for post-operative patients, advice was sought from the Palliative and Lymphoedema Senior Physiotherapist at Queen Margaret Hospital, Dunfermline. She deemed the proposed yoga postures to be appropriate as exercise is very important following breast surgery, as long as patients work within their own capabilities and do not strain themselves.

As the facilitator had limited experience teaching MBSR with oncology patients, an experienced MBSR clinician working in an oncology setting in the West of Scotland was consulted for advice and support. Recommendations included the metta meditation (discussed further in the outline of session 5 below) and a list of relevant literature. In addition, the researcher contacted leading researchers in the field of mindfulness and oncology, Dr Linda Carlson and Dr Michael Speca at the Department of Psychology in Calgary, Canada. Their programme was utilized in the current study as it has been adapted and standardised for cancer patients. However, due to the clinical context of the treatment centres used in Fife, the full day retreat was excluded and walking meditation was replaced by metta meditation.

An outline of each session follows (see appendix 16 for manual):

Session1- Introduction

Introductions and reasons for participation were shared and an overview and rationale of the intervention was presented. The booklet and CDs were distributed and home practice and record keeping explained. Group ground rules were reviewed and the concept of

mindful eating was introduced. Diaphragmatic breathing was explained and participants were guided through a body scan.

Session 2 – Mindfulness

All sessions commenced with a group discussion of home practice. Mindfulness attitudes (e.g. non-judging, acceptance, letting go) were introduced. Participants were introduced to lying yoga postures to help cultivate mindful awareness of the body while it is moving, stretching or holding a position.

Session 3 – Mind-Body Connection

Discussion of home practice was followed by an introduction to the stress response cycle. Psychoneuroimmunology was then introduced to highlight the link between stress and the immune and endocrine systems. Participants were then guided through a series of standing yoga postures.

Session 4 - Balance in the Autonomic Nervous System

Discussion of home practice was followed by a discussion of balance and the autonomic nervous system, highlighting the relaxation response. Mini breathing exercises were used and sitting meditation was introduced.

Session 5 – Attitudes and Coping

Discussion of home practice was followed by linking thoughts, beliefs and attitudes and how they affect the experience of stress. Metta meditation was introduced which

encourages participants to direct healing energy toward others as well as toward their own body. Participants were encouraged to practice without listening to the CD.

Session 6 - Imagery and Summary

A visualization exercise was used to demonstrate the interaction of mental imagery and bodily responses. Imagery as an adjunct to meditative practice was taught using a lake meditation during which participants were encouraged to imagine their minds like a choppy lake whilst there is inner calm below the surface of the waves. This was followed by discussion of personal experience over the course and plans for support and continuing practice.

2.7 Sample size estimation

Cohen's tables (1992) were used to determine the sample size necessary to detect a large effect size using independent t-tests at a power of 0.8 with an alpha of 0.05. This revealed that a study sample of 52 (26 in each group) was required to ensure the study had sufficient statistical power. A large effect size was anticipated based upon data from a randomised controlled trial of the effects of MBSR on mood in cancer patients which reported data with an effect size of 0.83 (Specia et al., 2000).

2.8 Approach to Analysis

Data analysis was carried out using SPSS for Windows (version 12). A mixed design ANOVA was used to evaluate whether changes occurred between the baseline and post-intervention assessments and whether any such changes differed between the control group and the MBSR group. Follow-up data were excluded from this analysis due to the

low response rate from controls. However, a repeated measures ANOVA was used to evaluate whether changes occurred in the intervention group across the 3 time points (baseline, post-intervention and follow-up).

Chapter 3: Results

3.1 Demographic characteristics

One hundred and sixty-five women were invited to take part in the study. Sixty-eight women opted into the study (41%), however, 9 dropped out before completing baseline measures. Of the remaining 59 participants (36%), 30 were randomly assigned to the MBSR group and 29 to the control group. Table 3.1 shows the demographics of participants in the MBSR and control group both for all those who completed baseline data and for those who completed both baseline and post intervention stages of the study. It can be seen from Table 3.1 that these demographic variables did not change substantially when those who dropped out of the study were excluded.

3.1.1 MBSR group

With regards to the 30 participants in the intervention group, the mean age was 55 years (SD. 9.5; range 35-77 years). On average, participants had 11.3 years (SD. 1.8) of education and 86.7% lived with family. The majority were married (70%) and more likely to be employed (full-time and part-time; 46.7%) than retired (16.7%) or on sick leave from work (36.7%). The average time since diagnosis of breast cancer was 9.3 months (SD. 4.1). Almost half the participants had a mastectomy (43.3%) and the majority had chemotherapy (56.7%). Almost half the participants had radiotherapy (46.7%) and a fifth had a lumpectomy (20%). Thirteen of the 30 participants had completed their treatment (43.3%). Further demographic information for participants in the MBSR group is shown in Table 3.1.

Table 3.1: Demographic Characteristics of Participants

Demographic Variable	Completed Baseline Measures		Completed Baseline and Post-Intervention Measures	
	MBSR (N=30)	Control (N=29)	MBSR (N=26)	Control (N=21)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Age (years)	55.9 (9.5)	54.1 (9.5)	55.4 (9.8)	54.3 (9.7)
Years of education	11.3 (1.8)	11.9 (2.4)	11.2 (1.9)	11.9 (2.4)
Months since diagnosis	9.3 (4.1)	10.0 (5.6)	9.2 (3.9)	10.5 (6.2)
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
Living arrangements				
• Living with family	26 (86.7)	25 (86.2)	22 (84.6)	17 (80)
• Living alone	4 (13.3)	4 (13.8)	4 (15.5)	4 (19)
Marital status				
• Single	0 (0)	1 (3.4)	0 (0)	1 (4.8)
• Separated	2 (6.7)	3 (10.3)	2 (7.7)	3 (14.3)
• Co-habiting	2 (6.7)	1 (3.4)	2 (7.7)	0 (0)
• Married	21 (70.0)	20 (69.0)	17 (65.4)	14 (66.7)
• Divorced	3 (10.0)	3 (10.3)	3 (11.5)	2 (9.5)
• Widowed	2 (6.7)	1 (3.4)	2 (7.7)	1 (4.8)
Employed				
• Full time	9 (30)	12 (41.4)	7 (26.9)	9 (42.9)
• Part time	5 (16.7)	5 (17.2)	4 (15.4)	3 (14.3)
• Retired	5 (16.7)	6 (20.7)	4 (15.4)	5 (23.8)
• Sick leave	11 (36.7)	6 (20.7)	11 (42.3)	4 (19)
Treatment				
• Mastectomy	13 (43.3)	11 (37.9)	12 (46.2)	9 (42.9)
• Lumpectomy	6 (20)	16 (55.2) *	5 (19.2)	10 (47.6) *
• Chemotherapy	17 (56.7)	20 (69.0)	16 (61.5)	12 (57.1)
• Radiotherapy	14 (46.7)	18 (62.1)	12 (46.2)	12 (57.1)
• Hormone Therapy	10 (33.3)	15 (51.7)	8 (30.8)	11 (52.4)
• Completed treatment	13 (43.3)	4 (13.8) *	11 (42.3)	3 (14.3) *

* $p < 0.05$ between MBSR and Control

3.1.2 Control group

With regards to the 29 participants in the control group, the mean age was 54 years (SD. 9.5; range 29-68 years). On average, participants had 11.9 years (SD. 2.4) of education and 86.2% lived with family. The majority were married (69%) and over half (58.6%) were still working. A fifth of participants were retired and a further fifth were on sick leave (both 20.7%). The average time since diagnosis was 10.5 months (SD. 6.2). The majority had a lumpectomy (55.2%), chemotherapy (69%) and radiotherapy (62.1%). Around half had adjuvant hormone therapy (51.7%) and only 13.8% had completed treatment. Further demographic information for participants in the control group is shown in Table 3.1.

3.1.3 Group comparison for demographic characteristics

As can be seen from the mean values in Table 3.1, demographic characteristics of participants recruited at baseline and those that completed the study did not vary significantly. At baseline, there were no significant differences between the MBSR and control group participants in terms of age ($t(45) = 0.380$, $p = 0.706$), education ($t(45) = 0.995$, $p = 0.325$) or months since diagnosis ($t(45) = 0.844$, $p = 0.403$). A higher proportion of participants in the intervention group were off work on sick leave than in the control group, however this difference was not statistically significant (36.7% vs. 20.7%; $\chi^2(1) = 2.423$, $p = 0.120$).

A significant difference was found in relation to completing treatment ($\chi^2(1) = 4.362$, $p = 0.037$) which suggests that the two groups differed in terms of the stage of their treatment.

As can be seen from Table 3.1, a higher percentage of participants in the MBSR group (43.3%) had completed treatment than in the control group (13.8%). There was also a significant difference between the two groups in terms of having a lumpectomy ($\chi^2 (1) = 4.309$, $p = 0.038$) with a greater proportion of participants in the control group (55.2%) having had a lumpectomy than in the MBSR group (20%). These significant differences for completing treatment (42.3% vs. 14.3%; $\chi^2 (1) = 6.273$, $p = 0.012$) and having a lumpectomy (20% vs. 55.2%; $\chi^2 (1) = 7.801$, $p = 0.005$) remained when those who dropped out from the study prior to completing post-intervention measures were excluded.

There were no significant differences between the MBSR and control group in terms of support ($\chi^2 (1) = 0.110$, $p = 0.740$) or mastectomy ($\chi^2 (1) = 0.051$, $p = 0.821$), chemotherapy ($\chi^2 (1) = 0.093$, $p = 0.760$), radiotherapy ($\chi^2 (1) = 0.561$, $p = 0.454$) or hormone therapy ($\chi^2 (1) = 2.253$, $p = 0.133$).

3.1.4 Response rates

The response rates for both the MBSR group and the control group at baseline, post-intervention and follow-up are shown in Table 3.2.

Table 3.2: Response Rates for MBSR and Control Groups

Stage	Total	MBSR Group	Control Group
Baseline	59	30	29
Post-intervention	47 (80%)	26 (87%)	21 (72%)
Follow-up	27 (46%)	22 (73%)	5 (17%)

3.1.5 Non-completers

As can be seen from Table 3.2, control group participants were less likely to have completed the post-intervention measures and much less likely to have completed follow-up measures. When participants who completed the baseline and post-intervention measures (completers) were compared with participants who dropped out after completing baseline measures (non-completers), there were no significant differences in any of the baseline demographic variables or scores (see Table 3.3).

Table 3.3: Demographics and Mean Scores for Completers & Non-Completers

Demographic variables and score means	Completers (N = 47)		Non-Completers (N = 12)	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Living arrangements				
• Living with family	39	83.0	12	100
Marital status				
• Single	1	2.1	0	0
• Separated	5	10.6	0	0
• Co-habiting	2	4.3	1	8.3
• Married	31	66.0	10	83.3
• Divorced	5	10.6	1	8.3
• Widowed	3	6.4	0	0
Employed				
• Full time	16	34.0	5	41.7
• Part time	7	14.9	3	25.0
• Retired	9	19.1	2	16.7
• Sick leave	15	31.9	2	16.7
Treatment				
• Mastectomy	21	44.7	3	25.0
• Lumpectomy	15	31.9	7	58.3
• Chemotherapy	28	59.6	9	75.0
• Radiotherapy	24	51.1	8	66.7
• Hormone Therapy	19	40.4	6	50.0
• Finished treatment	14	29.8	3	25.0
	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>
Age (years)	54.9	9.6	55.5	8.9
Years of education	11.5	2.1	11.9	2.1
Months since diagnosis	9.7	5.0	9.1	4.3
MAAS	59.4	14.6	62.4	15.3
POMS	79.0	43.4	81.5	39.4
MAC-fighting spirit	50.6	8.9	55.4	6.2
MAC-anxious	22.6	4.1	22.5	2.8
preoccupation				
MAC-helpless-hopeless	9.6	3.9	10.7	3.8
COPE-problem-focused	21.1	6.1	20.3	6.8
COPE-avoidance	20.7	5.7	23.1	7.2
COPE-acceptance	12.9	2.6	12.6	2.9

3.2 Exploration of data

The data were screened and analysed using SPSS version 12 (SPSS Inc 1990) and explored prior to statistical analysis. All data were checked for normality by utilising the Kolmogorov-Smirnov and the Shapiro-Wilkes tests of normality. Where applicable, the data were investigated for skewness and kurtosis, with significance set at the < 0.05 level. Unless stated in the text, the data met the assumption of normality and homogeneity of variance. Occasional missing values were replaced by the means of all the cases.

Results of a reliability analysis carried out for each of the measures used in the study are presented in Table 3.4. Most measures showed acceptably high reliability, with the exception of the MAC-anxious preoccupation scale. It was decided to retain this measure with caution, though reliability for this scale is at the lower end of the acceptable range.

Table 3.4: Reliability Analysis for Measures Used in the Study

Scale	No of items	Cronbach's Alpha (α)
MAAS	15	0.91
POMS	63	0.92
MAC-fighting spirit	16	0.91
MAC-anxious preoccupation	9	0.53
MAC-helpless/hopeless	6	0.83
COPE-problem focused coping	8	0.87
COPE-avoidance coping	12	0.79
COPE-acceptance	4	0.63

3.3 Data analysis

The intention had been to conduct a repeated measures mixed ANOVA for all three time points, however the low return rate of follow-up data from the control group would have significantly underpowered the analysis.

Therefore, to test the hypotheses which related to the control group, mixed ANOVA designs were used comparing the within groups variable of time (baseline and post-intervention) and the between groups variable of condition (intervention and control group). Follow-up data were excluded from these analyses due to the low follow-up response rate for the control group. Where applicable, repeated measures ANOVAs were subsequently used to determine changes in the intervention group across the 3 time points (baseline, post-intervention and follow-up) and post hoc comparisons were conducted using Bonferroni tests. Correlations were also conducted, using Pearson's correlations, to ascertain whether mindfulness and the coping strategies were associated with levels of distress.

Table 3.5 (appendix 17) displays the mean values for all of the study variables across each time point. Table 3.6 corresponds with the mixed ANOVAs, as it displays mean scores at baseline and post-intervention for all participants who completed post-intervention measures. Thus, baseline means were adjusted to only include participants who completed post-intervention data. Table 3.7 corresponds with the repeated measures ANOVAs, as it displays mean scores for those participants in the MBSR group who completed measures at all three time points.

Table 3.6: Mindfulness, Coping Style and Distress Mean Scores for Participants who Completed Post-Intervention Measures

Variable	Baseline M (S.D.)		Post Intervention M (S.D.)	
	MBSR (N=26)	Control (N=21)	MBSR (N=26)	Control (N=21)
MAAS	59.7 (17.4)	59.1 (10.9)	66.2 (14.9)	57.1 *
MAC				
-fighting spirit	49.9 (9.9)	52.7 (7.3)	51.4 (5.9)	52.4 (6.9)
-anxious preoccupation	22.1 (4.9)	23.4 (3.2)	21.8 (3.5)	23.6 (2.4)
-helpless/hopeless	9.7 (4.4)	9.7 (3.3)	9.2 (3.4)	9.8 (2.8)
POMS	78.8 (47.3)	79.4 (39.2)	56.2 (25.6)	85.7 *
COPE				
-acceptance	13.0 (2.9)	12.8 (2.3)	12.7 (3.5)	12.8 (2.4)
-problem focused coping	21.5 (6.6)	20.9 (5.7)	21.9 (6.4)	20.1 (6.2)
-avoidance coping	20.3 (6.4)	21.4 (5.1)	20.0 (5.9)	20.3 (5.3)

* $p < 0.05$ between MBSR and control group at post-intervention

MAAS: Mindfulness measure; POMS: Distress measure

Table 3.7: Mindfulness, Coping Style and Distress Mean Scores for MBSR Group

Variable	Baseline	Post Intervention	Follow-up
	M (S.D.) (N=22)	M (S.D.) (N=22)	M (S.D.) (N=22)
MAAS	61.9 (16.2)	68.5 (13.5)	71.3 (13.3)*
MAC			
-fighting spirit	49.9 (8.4)	51.2 (5.8)	53.1 (6.8)
-anxious preoccupation	21.7 (4.6)	21.1 (2.9)	21.3 (3.1)
-helpless/hopeless	9.1 (3.5)	8.8 (2.8)	8.7 (2.8)
POMS	70.9 (43.9)	51.9 (23.2)*	44.1 (30.2)*
COPE			
-acceptance	12.9 (3.0)	12.4 (3.7)	12.4 (3.8)
-problem focused coping	22.1 (6.9)	22.2 (6.9)	22.7 (6.5)
-avoidance coping	18.8 (4.4)	18.9 (4.5)	19.1 (4.5)

* $p < 0.05$ between baseline and either post-intervention scores or follow-up scores

MAAS: Mindfulness measure; POMS: Distress measure

3.3.1 Hypothesis 1

Hypothesis 1 (a)

Engagement in the Mindfulness-Based Stress Reduction programme will reduce avoidance responses to breast cancer compared to a control group.

A mixed ANOVA was conducted to ascertain whether participating in the MBSR group reduced avoidant coping between baseline and post-intervention relative to controls. No significant main effects were found for condition (intervention v control; $F(1,45) = 0.204$, $p = 0.654$) or time (pre v post; $F(1,45) = 1.607$, $p = 0.211$). There was no significant interaction between time and condition ($F(1,45) = 0.562$, $p = 0.458$). Thus, this hypothesis was not supported.

Hypothesis 1 (b)

Engagement in the Mindfulness-Based Stress Reduction programme will reduce helpless-hopeless responses to breast cancer compared to a control group.

A mixed ANOVA was conducted to determine whether participating in the MBSR programme reduced helpless-hopeless responses between baseline and post-intervention relative to controls. No significant main effects were found for the condition (intervention v control; $F(1,45) = 0.072$, $p = 0.789$) or time (pre v post; $F(1,45) = 0.164$, $p = 0.688$) variables. No significant interaction between time and condition was found ($F(1,45) = 0.378$, $p = 0.542$). Thus, this hypothesis was not supported.

Hypothesis 1 (c)

Engagement in the Mindfulness-Based Stress Reduction programme will reduce anxious preoccupation responses to breast cancer compared to a control group.

A mixed ANOVA was carried out to ascertain whether participating in the MBSR programme reduced anxious preoccupation between baseline and post-intervention

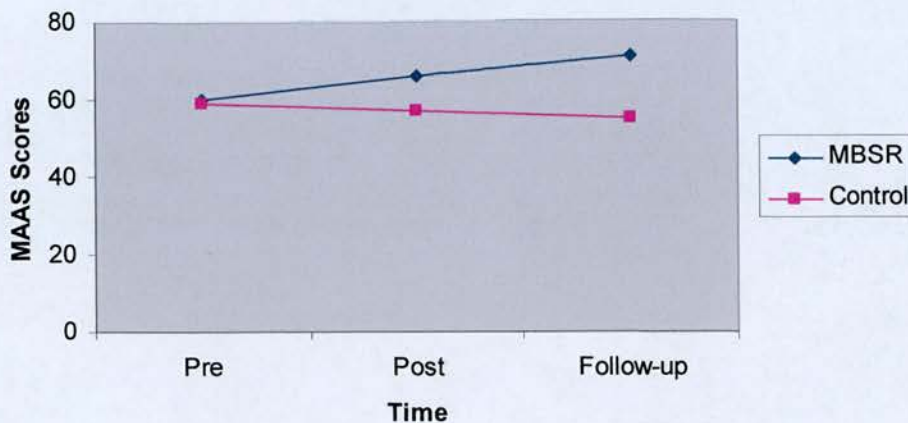
relative to controls. No significant main effects were found for the condition (intervention v control; $F(1,45) = 2.676$, $p = 0.109$) or time (pre v post; $F(1,45) = 0.005$, $p = 0.942$) variables. No significant interaction between time and condition was found ($F(1,45) = 0.335$, $p = 0.566$). Thus, this hypothesis was not supported.

3.3.2 Hypothesis 2

Hypothesis 2 (a)

Engagement in the Mindfulness-Based Stress Reduction programme will increase mindfulness in breast cancer outpatients compared to a control group.

A mixed ANOVA was conducted to determine whether participating in the MBSR programme increased levels of mindfulness. No significant main effects were found for the condition (intervention v control; $F(1,45)=1.733$, $p = 0.195$) or time (pre v post; $F(1,45) = 2.069$, $p = 0.157$) variables. However, a significant interaction between time and condition was found ($F(1,45) = 7.565$, $p = 0.009$), reflecting increases in mindfulness scores in the MBSR group and a slight reduction in mindfulness scores in the control group (see Figure 3.1 and Table 3.6).

Figure 3.1: Mean Mindfulness Scores over Time

Footnote: Pre and post data based on means for participants who completed both baseline and post-intervention mindfulness measures (MBSR: $N = 26$; Control: $N = 21$). Follow-up data based on participants who completed mindfulness measures at all three time points (MBSR: $N = 22$; Control: $N = 5$).

Subsequent analysis using a one-way repeated measures ANOVA involving only the intervention group revealed a significant main effect of time $F(2,42) = 6.414$, $p = 0.004$. Post hoc analysis using the Bonferroni test revealed a significant difference ($p = 0.018$) between baseline ($M = 61.9$, $SD = 16.2$) and follow-up ($M = 71.3$, $SD = 13.3$) mindfulness scores in the intervention group. Thus, this hypothesis was supported.

Hypothesis 2 (b)

Engagement in the Mindfulness-Based Stress Reduction programme will increase active approaches to problem-focused coping in breast cancer outpatients compared to a control group.

A mixed ANOVA was conducted to ascertain whether participating in the MBSR programme increased problem focused coping. No significant main effects were found for the condition (intervention v control; $F(1,45) = 0.176$, $p = 0.677$) or time (pre v post; $F(1,45) = 1.337$, $p = 0.603$) variables. No significant interaction between time and condition was found $F(1,45) = 0.1000$, $p = 0.753$). Thus, this hypothesis was not supported.

Hypothesis 2 (c)

Engagement in the Mindfulness-Based Stress Reduction programme will increase fighting spirit in breast cancer outpatients compared to a control group.

A mixed ANOVA was carried out to determine whether participating in the MBSR programme increased fighting spirit. No significant main effects were found for the condition (intervention v control; $F(1,45) = 1.370$, $p = 0.248$) or time (pre v post; $F(1,45) = 1.069$, $p = 0.307$) variables. No significant interaction between time and condition was found ($F(1,45) = 1.606$, $p = 0.212$). Thus, this hypothesis was not supported.

Hypothesis 2 (d)

Engagement in the Mindfulness-Based Stress Reduction programme will increase acceptance in breast cancer outpatients compared to a control group.

A mixed ANOVA was conducted to ascertain whether participating in the MBSR programme increased acceptance. No significant main effects were found for the condition (intervention v control; $F(1,45) = 0.007$, $p = 0.936$) or time (pre v post; $F(1,45) = 0.193$, p

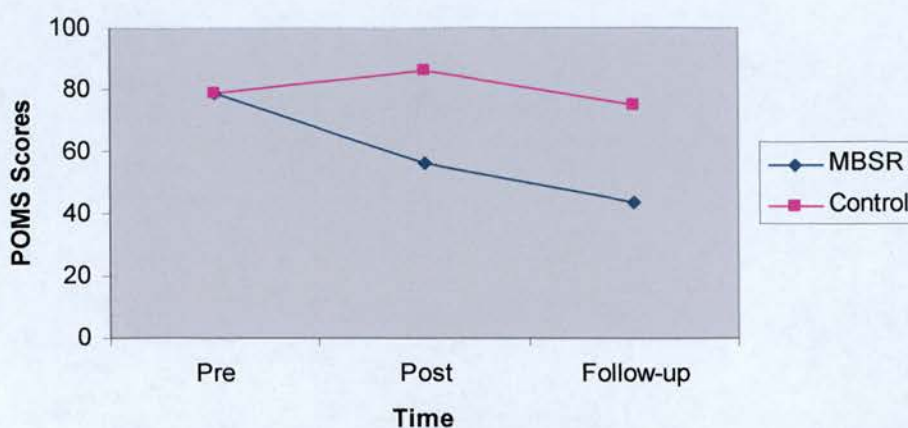
= 0.662) variables. No significant interaction between time and condition was found $F(1,45) = 0.318, p = 0.576$). Thus, this hypothesis was not supported.

3.3.3 Hypothesis 3

Engagement in the Mindfulness-Based Stress Reduction programme will be associated with lower levels of distress compared to a control group.

A mixed ANOVA was conducted to ascertain whether participating in the MBSR group had an impact on levels of distress as determined by the POMS. A significant main effect was found for time (pre v post; $F(1,45) = 4.350, p = 0.043$) and there was a significant interaction between time and condition ($F(1,45) = 13.749, p < 0.001$). There was no main effect for condition (intervention v control; $F(1,45) = 2.077, p = 0.157$). As can be seen from Table 3.6, Table 3.7 and Figure 3.2, distress levels in the MBSR group dropped significantly after the MBSR intervention compared to the control group, and the MBSR group's distress levels had decreased further by the time of the 3 month follow-up.

Subsequent analysis using a one-way repeated measures ANOVA involving only the intervention group revealed a significant main effect of time $F(2,42) = 11.364, p < 0.001$). Post hoc analysis using the Bonferroni test revealed a significant difference ($p = 0.029$) between baseline ($M = 70.9, SD = 43.9$) and post-intervention ($M = 51.9, SD = 23.2$) distress scores in the intervention group. There was also a significant difference ($p = 0.002$) between baseline ($M = 70.9, SD = 43.9$) and follow-up ($M = 44.1, SD = 30.2$) distress scores.

Figure 3.2: Mean Distress Scores over Time

Footnote: Pre and post data based on means for participants who completed both baseline and post-intervention distress measures (MBSR: N = 26; Control: N = 21). Follow-up data based on participants who completed distress measures at all three time points (MBSR: N = 22; Control: N = 5).

3.4 Exploratory analysis

3.4.1 POMS subscale scores

As significant differences were found between levels of distress (as measured by the POMS scale), each subscale was investigated further. Table 3.8 (appendix 18) displays the mean values for each subscale across the 3 time points. Similar to the previous tables, Table 3.9 displays baseline means only for those participants who completed post-intervention data and Table 3.10 displays the means for those participants in the MBSR group who completed measures at all three time points.

Table 3.9: Mean POMS Subscale Scores at Baseline and Post-Intervention

POMS Subscales	Baseline		Post Intervention	
	M (S.D.)		M (S.D.)	
	MBSR (N=26)	Control (N=21)	MBSR (N=26)	Control (N=21)
Tension	19.9 (8.9)	19.9 (7.5)	16.2 (5.4)	20.8 ** (6.9)
Depression	26.6 (14.7)	25.9 (11.8)	21.6 (8.9)	27.0 ** (10.1)
Anger	20.6 (10.2)	19.2 (5.5)	15.81 (4.2)	19.3 * (6.3)
Vigour	21.8 (7.9)	20.8 (6.1)	25.0 (6.1)	18.9 ** (6.4)
Fatigue	16.8 (7.3)	18.7 (9.4)	12.9 (4.9)	20.6 ** (8.2)
Confusion	16.7 (5.8)	16.5 (4.7)	14.6 (3.9)	16.9 * (4.7)

* $p < 0.05$, ** $p < 0.01$ between MBSR and control group at post-intervention

POMS: Distress measure

Table 3.10: Mean POMS Subscale Scores for MBSR Group

Variable	Baseline	Post Intervention	Follow-up
	M (S.D.) (N=22)	M (S.D.) (N=22)	M (S.D.) (N=22)
Tension	18.9 (9.0)	15.5 (5.1)	13.6 (6.3) **
Depression	24.4 (13.1)	20.6 (7.5)	19.6 (8.4)
Anger	19.7 (9.7)	15.4 (3.6) *	15.2 (4.6) *
Vigour	23.1 (7.7)	25.6 (6.3)	28.2 (8.2) **
Fatigue	15.1 (6.4)	12.2 (4.6)	11.3 (5.5) **
Confusion	15.7 (5.4)	13.9 (3.7)	12.5 (3.3) **

* $p < 0.05$ between baseline and either post-intervention or follow-up scores

** $p < 0.01$ between baseline and follow-up scores

POMS: Distress measure

3.4.1.1 Tension

A mixed ANOVA was conducted to ascertain whether participating in the MBSR group had an impact on levels of tension. A significant interaction between time and condition was found ($F(1,45) = 8.010$, $p = 0.007$) reflecting a modest reduction in intervention group tension scores between baseline and post-intervention, whilst those of the control group stayed fairly constant (see Table 3.9). There was no main effect for time or condition. Subsequent repeated measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 9.129$, $p < 0.001$). Post hoc analysis revealed a significant difference ($p = 0.002$) between baseline ($M = 18.9$, $SD = 9.0$) and follow-up

($M = 13.6$, $SD = 6.3$) tension scores but not between baseline and post-intervention. These results reflect the data in Table 3.10, which demonstrates that the intervention group's tension scores continued to reduce between the intervention and the three month follow-up.

3.4.1.2 Depression

A mixed ANOVA was conducted to ascertain whether participating in the MBSR group had an impact on levels of depression. A significant interaction between time (baseline and post-intervention) and condition was found ($F(1,45) = 8.350$, $p = 0.006$). There was no main effect for time or condition. As can be seen from Table 3.9, there was a reduction in intervention group depression scores between baseline and post-intervention, whilst those of the control group stayed fairly constant. Subsequent repeated measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 4.702$, $p = 0.034$). Table 3.10 demonstrates that there was a further reduction in the MBSR group's depression scores following the intervention, however post hoc analysis did not reveal any significant differences.

3.4.1.3 Anger

In the mixed ANOVA analysis, there was a significant main effect of time ($F(1,45) = 6.715$, $p = 0.013$) and a significant interaction between time and condition ($F(1,45) = 6.989$, $p = 0.011$). Table 3.9 shows there was a significant reduction in anger scores in the MBSR group after the intervention, compared to the control group. There was no main effect for condition. Subsequent repeated measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 8.075$, $p = 0.006$).

Post hoc analysis revealed a significant difference ($p = 0.032$) between baseline ($M = 19.7$, $SD = 9.7$) and post-intervention ($M = 15.4$, $SD = 3.6$) and a significant interaction ($p = 0.017$) between baseline and follow-up ($M = 15.2$, $SD = 4.6$) (see Table 3.10). This suggests that having completed the MBSR group, participants rated themselves as significantly less angry and that this change was maintained at 3 month follow-up.

3.4.1.4 Vigour

In the mixed ANOVA analysis, there was a significant interaction between time and condition ($F(1,45) = 11.444$, $p = 0.001$). The main effect of condition almost reached significance ($F(1,45) = 3.931$, $p = 0.054$). As can be seen from Table 3.9, vigour scores in the MBSR group increased significantly after the MBSR intervention, compared to the control group which slightly decreased. There was no main effect for time. Subsequent repeated measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 8.290$, $p < 0.001$). Post hoc analysis revealed a significant difference ($p = 0.005$) between baseline ($M = 23.1$, $SD = 7.7$) and follow-up ($M = 28.2$, $SD = 8.2$). These results reflect increased levels of vigour amongst the intervention group over time (see Table 3.10).

3.4.1.5 Fatigue

In the mixed ANOVA analysis, there was a significant main effect of condition ($F(1,45) = 5.792$, $p = 0.020$) and a significant interaction between time and condition ($F(1,45) = 9.113$, $p = 0.004$). There was no main effect for time. This reflects that the MBSR group reported feeling less fatigued post-intervention than at baseline, whilst participants in the control group reported feeling slightly more fatigued (see Table 3.9). Subsequent repeated

measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 7.355, p = 0.002$). Post hoc analysis revealed a significant difference ($p = 0.003$) between baseline ($M = 15.1, SD = 6.4$) and follow-up ($M = 11.3, SD = 5.5$) which can be seen in Table 3.10.

3.4.1.6 Confusion

In the mixed ANOVA analysis, a significant interaction between time and condition was found ($F(1,45) = 6.008, p = 0.018$). This reflects differences observed in mean scores in which participants in the MBSR group report feeling less confused over time, whereas control group confusion scores remain fairly constant (see Figure 3.9). There was no main effect for condition or time. Subsequent repeated measures analysis involving only the intervention group revealed a significant main effect of time ($F(2,42) = 9.098, p < 0.001$). Post hoc analysis revealed a significant difference ($p < 0.001$) between baseline ($M = 15.7, SD = 5.4$) and follow-up ($M = 12.5, SD = 3.3$) which can be seen in Table 3.10.

3.4.2 Association between distress and mindfulness

Correlations were conducted to ascertain whether there was a relationship between distress and mindfulness. A significant association was found ($r = -0.804, p < 0.001$). This suggested that higher levels of mindfulness were related to lower levels of distress.

3.4.3 Association between distress and coping

Correlations were conducted to ascertain whether the coping strategies were associated with levels of distress. Significant associations were found between distress (as measured by the POMS) and anxious preoccupation ($r = 0.438, p = 0.002$), helpless-hopeless coping

($r = 0.734$, $p < 0.001$) and avoidance ($r = 0.655$, $p < 0.001$). This suggested that the use of these coping strategies were related to higher levels of distress.

3.4.4 Age

Correlations were conducted to ascertain whether there was a relationship between age and distress. A significant though modest association was found between age and levels of distress ($r = -0.258$, $p = 0.048$), with younger women rating higher levels of distress.

3.4.5 Intention-to-treat analysis

An intention-to-treat (ITT) analysis was also conducted using all 59 participants who were randomised, regardless of whether they dropped out of the study at post-intervention or follow-up. This was conducted by carrying forward each participant's last available data. Results of the ITT Analysis carried out for each of the measures used in the study are presented in Table 3.11. Despite being a more conservative analysis, the results were the same. No significant findings were found between the MBSR and control groups, over time, for any of the coping variables. Similarly, a significant interaction between time and condition was found for both mindfulness and distress scores, as well as a significant main effect of time for distress scores.

Table 3.11: ITT Analysis Results for each Measure Used in the Study

Scale	F	p-value	Mean (S.D.) MBSR	Mean (S.D.) Control
MAAS			60.2 (17.3)	59.8 (11.9)
Main Effect for Time	2.793	0.100		
Main Effect for Condition	1.302	1.302		
Interaction	8.157	0.006 *		
POMS			77.0 (45.7)	82.2 (39.1)
Main Effect for Time	5.483	0.023 *		
Main Effect for Condition	3.497	0.067		
Interaction	14.769	0.001 *		
MAC-fighting spirit			50.4 (9.9)	52.9 (7.1)
Main Effect for Time	1.327	0.254		
Main Effect for Condition	0.614	0.436		
Interaction	1.865	0.177		
MAC-anxious preoccupation			22.2 (4.5)	23.1 (3.2)
Main Effect for Time	0.016	0.900		
Main Effect for Condition	1.818	0.183		
Interaction	0.348	0.558		
MAC-helpless/hopeless			9.8 (4.1)	10.0 (3.7)
Main Effect for Time	0.215	0.645		
Main Effect for Condition	0.250	0.619		
Interaction	0.431	0.514		
COPE-problem focused coping			21.3 (6.6)	20.7 (6.0)
Main Effect for Time	0.186	0.668		
Main Effect for Condition	0.167	0.685		
Interaction	0.055	0.815		
COPE-avoidance coping			20.6 (6.7)	21.9 (5.5)
Main Effect for Time	0.697	0.407		
Main Effect for Condition	0.594	0.444		
Interaction	0.335	0.565		
COPE-acceptance			13.0 (3.0)	13.0 (2.0)
Main Effect for Time	0.244	0.623		
Main Effect for Condition	0.870	0.870		
Interaction	0.370	0.546		

* $p < 0.05$; Time: Baseline v Post-Intervention; Condition: MBSR v Control

df = 1, 57; MAAS: Mindfulness measure; POMS: Distress measure

Subsequent analysis using a one-way repeated measures ANOVA involving only the MBSR group revealed the same significant findings as the previous results. A significant main effect of time ($F(2, 56) = 6.041, p = 0.004$) was found for mindfulness scores. Post hoc analysis using the Bonferroni test revealed a significant difference ($p = 0.021$) between baseline ($M = 61.6, SD = 16.2$) and follow-up ($M = 68.7, SD = 13.3$) mindfulness scores. A significant main effect of time was also found for the distress scores ($F(2, 58) = 15.883, p = 0.001$). Post hoc analysis revealed a significant difference ($p = 0.004$) between baseline ($M = 77.0, SD = 43.9$) and post-intervention ($M = 57.4, SD = 23.2$) distress scores in the intervention group. There was also a significant difference ($p = 0.001$) between baseline ($M = 77.0, SD = 43.9$) and follow-up ($M = 51.6, SD = 30.2$) distress scores.

3.5 Summary of results

The MBSR intervention and control groups did not differ significantly between baseline and post-intervention on any of the coping strategy measures. However, significant differences were found on measures of mindfulness and levels of distress, with the MBSR group having higher levels of mindfulness and lower levels of distress than the control group post-intervention. Exploration of the distress subscales indicated reductions in the MBSR group across all subscales, with reductions at follow-up being particularly pronounced in the domains of tension, depression, anger, vigour, fatigue and confusion. Improvements in the MBSR group's distress scores continued beyond the intervention, with lower levels of distress observed at follow-up than post-intervention. These findings will now be investigated with reference to the current literature, taking into account strengths and limitations of the current study.

Chapter 4: Discussion

4.1 Summary of Research

Mindfulness-Based Stress Reduction (MBSR) was developed by Kabat-Zinn and is time limited and patient centered. Its ultimate goal is to teach patients skills that they can apply proactively to their lives, including their illnesses, long after the programme ends. These skills include a variety of mindfulness techniques such as meditation, yoga, and a body awareness technique called the body scan. Research has investigated the use of MBSR in treating chronic pain (Kabat-Zinn et al. 1985), anxiety (Miller et al. 1995), depression (Segal et al. 2002), HIV (Robinson et al. 2003) and fibromyalgia (Weissbecker et al. 2002).

Although the use of MBSR with cancer patients is sparse, there is a growing body of literature that has shown that MBSR does hold promise as a highly effective psychosocial approach for the management of stress and mood disturbance in cancer (Specia et al. 2000, Carlson et al. 2003). However, there has been a lack of research with homogeneous populations (much of the cancer research combines patients with different types of cancer) and there has been little uptake of MBSR in cancer settings in the UK. In addition to this, the psychosocial factors that have been investigated in breast cancer are limited. Psychological adjustment to cancer is an important factor that has only begun to be investigated among cancer patients in a mindfulness-based intervention (Tacon et al., 2004).

Better psychological adjustment for cancer patients has been associated with an active approach to problem solving, a fighting spirit (Watson et al. 1991), acceptance and humour (Carver et al. 1993). Worse adjustment has been associated with coping strategies that involve avoidance (Stanton et al. 2002), helplessness/hopelessness and anxious preoccupation (Nordin & Glimelius, 1998). This study aimed to evaluate the effectiveness of an MBSR intervention on adjustment to breast cancer. Fifty-nine breast cancer patients were randomly allocated to either an MBSR group or a waiting-list control. Measures of coping, adjustment, mood and mindfulness were given at baseline, post-intervention and at three-month follow-up.

It was hypothesised that MBSR would reduce avoidance, helpless-hopeless and anxious preoccupation and increase mindfulness and active approaches to problem solving, fighting spirit and acceptance relative to controls. It was also hypothesised that the MBSR intervention would be associated with lower levels of distress relative to controls. No significant differences were found between the MBSR and control groups, over time, for any of the coping variables. However, there was a significant increase in mindfulness scores and a significant decrease in distress scores in the MBSR group.

4.2 Discussion of the research findings

4.2.1 Hypothesis 1-Reduce Avoidance, Helpless-Hopeless & Anxious Preoccupation

The first aim of this study was to ascertain whether participation in the MBSR group reduced avoidance, helpless-hopeless and anxious preoccupation responses to breast cancer compared to a control group.

4.2.1.1 Avoidance

No significant difference was found between the MBSR group and the control group in terms of avoidance. The essence of mindfulness contrasts with avoidance as it encourages paying attention to experiences and accepting the reality of the present moment. This avoidant coping response has not been studied in an MBSR intervention before, thus comparison of findings are limited. However, Tacon et al. (2005) measured a suppressive coping style, as measured by the Problem-Focused Styles of Coping measure (PF-SOC; Heppner et al., 1995) and found a significant decrease in suppressive coping scores following an MBSR intervention. Although not measuring the same construct, this suppressive coping style is associated with the repression and avoidance of negative emotions and experiences (Temoshok, 1987).

Avoidant coping has been linked to worse adjustment in breast cancer patients (Hack & Degner, 2004; Stanton et al., 2002; McCaul et al., 1999; Friedman et al., 1989; Carver et al., 1993; Stanton & Snider, 1993). The results from this study lend support to the well documented association between avoidance and increased distress levels.

4.2.1.2 Helpless-Hopeless

This study did not find a significant difference between the MBSR and control groups, over time, for helpless-hopeless responses to breast cancer. Patients can often experience feelings of helplessness when diagnosed with cancer and the ensuing treatment and can feel hopeless with regard to the future. Mindfulness encourages patients to take a proactive stance during times of such despair. Contrary to the findings of the current study, Tacon et al. (2004) and (2005) found statistically significant reductions in helpless-hopeless scores following an 8-week MBSR programme. The mean changes were small but nevertheless statistically significant. This was deemed to be an important finding as some studies have shown that women who respond to cancer with high helpless-hopeless responses are at increased risk of recurrence or death (Watson et al., 1999). However, the area of coping strategies and mortality rates remains a contentious issue.

The use of a helpless-hopeless coping strategy has been associated with worse adjustment in the breast cancer literature (Parle et al., 1996; Watson et al., 1991; Watson et al., 1994; Schnoll et al., 1998; Carver et al., 1993; Heim et al., 1997). This association was supported in the current study as the use of helpless-hopeless coping was related to higher levels of distress.

4.2.1.3 Anxious Preoccupation

This study did not find a significant difference between the MBSR and control group in terms of anxious preoccupation. Rather than worrying about the illness, MBSR can teach patients to focus awareness on the breath which can become a familiar focal point for the mind. Perhaps no difference on anxious preoccupation was found as asking patients to

focus on their body during aspects of the MBSR intervention, such as the body scan and yoga techniques, encourages patients to be more preoccupied with physical symptoms. However, Tacon et al. (2004) and (2005) found a significant reduction in anxious preoccupation scores following an eight week MBSR group. It is possible that the current study did not find an effect of the MBSR intervention upon reduced anxious preoccupation either because the intervention was not long enough or lacked statistical power.

The literature suggests that being anxiously preoccupied with cancer is associated with worse adjustment (Schnoll et al., 1998; Nordin & Glimelius, 1998). This association was supported by the current study as the use of anxious preoccupation coping was related to higher levels of distress.

4.2.2 Hypothesis 2-Increase Mindfulness, Problem-Focused Coping, Fighting Spirit & Acceptance

The second aim of this study was to ascertain whether participation in the MBSR group increased mindfulness and active approaches to problem focused coping, fighting spirit and acceptance in breast cancer patients compared to a control group.

4.2.2.1 Mindfulness

In the present study, mindfulness scores had significantly increased in the MBSR group post-intervention compared to the control group. Mindfulness scores in the MBSR group continued to increase beyond the intervention, such that they were highest at three month follow-up. This is not surprising given that participants continue to practice after the group

which is often when they develop their skills in mindfulness. Brown & Ryan (2003) demonstrated that higher levels of mindfulness were related to declines in mood disturbance and stress in a non-clinical population. Similarly, Carlson & Brown (2005) found higher MAAS scores were related to lower mood disturbance and stress in an oncology population. They concluded that lower levels of psychological well being may, in part, be due to lower levels of mindfulness. In accordance with these studies, the current study found greater mindfulness was associated with a decrease in distress.

4.2.2.2 Problem-Focused Coping

The current study did not find a significant difference in problem-focused coping between the MBSR and control group. Kabat-Zinn (1990) argued that there are two major components to emotional pain; feelings and the problem which caused the feelings. If a person can differentiate between the two, by being mindful, they are more likely to be able to resolve both. However, the two domains often become confused when facing a diagnosis of breast cancer, which can make it very difficult to see clearly to decide on the best option. In this way, mindfulness could aid problem-focused coping as it could help prevent actions based on strong emotional reactions which are likely to exacerbate a situation. This problem-focused coping response has not been studied in an MBSR intervention before, thus comparison of findings are limited. However, Tacon et al. (2005) used the Problem-Focused Styles of Coping measure (PF-SOC; Heppner et al., 1995) and found a significant decrease in reactive and suppressive coping scores following an MBSR intervention.

While no association was found between problem-focused coping and levels of distress in the current study, research has generally found that the problem-focused coping strategy is related to better adjustment (Carver et al., 1993; Chen et al., 1996; Epping-Jordan et al., 1999). In accordance with the current study, Stanton et al. (2002) did not report a significant association between problem-focused coping and distress over time, but found that breast cancer patients high in hope demonstrated a greater decrease in distress when they reported lower problem-focused coping. The authors argued that intense engagement in problem-focused coping may be counterproductive when a situation is outwith a patient's control as it is less amenable to problem solving attempts.

It may be that active problem-focused coping is situation specific as there are certain times during treatment planning when patients can actively seek information and exercise an element of control. During the treatment phase however, patients have limited control over their care as this is often dictated by treatment protocols. Thus, the current study may not have found an effect for problem-focused coping as many patients varied significantly on the continuum from diagnosis to treatment. Another possibility for the lack of significant results could be due to high scores for problem-focused coping at baseline, hence there was less room for improvement following the intervention. It is not surprising that patients who actively chose to opt into the study scored highly in active problem-focused strategies.

4.2.2.3 Fighting Spirit

The current study found that fighting spirit scores changed in a positive direction over time in the MBSR group but this change was not statistically significant. In accordance

with this study, Tacon et al. (2005) found fighting spirit changed in a positive direction following the MBSR intervention, but the changes were not significant. The current study had the benefit of a waiting-list control and the scores for this group remained constant over time. Baseline scores on the fighting spirit measure in the current study were very high (a mean score of 49 (SD 9.9) out of a possible 63) in comparison to Tacon's study (2005) which reported a mean score of 31. Hence, there may have been a ceiling effect in the current study.

Fighting spirit has been consistently associated with better adjustment in the breast cancer literature (Nelson et al., 1989; Moorey & Greer, 1989; Watson et al., 1994; Classen et al., 1996; Schnoll et al., 1998). However, no association was found between fighting spirit and levels of distress in the current study.

4.2.2.4 Acceptance

No significant differences in acceptance were found in this study between the MBSR and control group. Mindfulness is based on an attitude of acceptance, thus it seemed likely that learning mindfulness would increase participants' acceptance of the reality of a diagnosis of breast cancer. This coping response has not been studied in an MBSR intervention before, thus comparison of findings is not possible. However, the absence of a significant improvement in the MBSR group could, in part, be explained by the high scores at baseline on the acceptance measure (a mean of 13 (SD 2.9) out of a possible 16). Thus, again there may have been a ceiling effect.

Acceptance of the reality of a cancer diagnosis has been linked to better adjustment (Carver et al., 1993; Stanton et al., 2002). However, the current study found no association between acceptance and levels of distress.

4.2.3 Hypothesis 3-Reduce Distress

The final aim of this study was to ascertain whether participation in the MBSR group was associated with lower levels of distress compared to a control group. In line with theoretical expectations, the evidence from the current study suggests that MBSR does reduce levels of distress.

There is clear evidence to suggest that cancer patients experience a significant amount of distress following diagnosis. Yet, MBSR research has produced mixed findings regarding its effectiveness in reducing such distress. Carlson et al. (2004) did not find a change in distress score using the POMS following their MBSR intervention which they attributed to a low level of initial mood disturbance creating a floor effect. Similar results were found in a later study (Carlson et al., 2007). Carlson et al. (2001) found a decrease in distress was maintained at a six month follow up but this change was not significant.

Speca et al. (2000) found that a relatively brief (7 sessions for 1.5 hours) MBSR programme significantly reduced levels of distress, with a 65% reduction in distress levels post-intervention. The current study found a 30% reduction at post-intervention and a 44% reduction at follow-up. Whilst the results of the current study may not compare as favourably as the study by Speca et al. (2000), it gives further support to the efficacy of MBSR in reducing distress.

4.2.4 Influence of Mood on Behaviour

The current study found a significant change in all of the POMS subscales in the MBSR group post-intervention relative to the control group. This is consistent with Speca et al. (2000), who reported significant improvements in POMS scores for anxiety, depression, anger, vigour and confusion also significantly changed in the direction of reduced distress. Fatigue was the only subscale not to change significantly. The negative psychological consequences of a cancer diagnosis have been well documented. Ashbury et al. (1998) surveyed 913 cancer patients and reported that 94% experienced one or more of the following symptoms: fatigue (78%), anxiety (77%), depression (59%) and sleep disturbance (54%).

4.2.4.1 Tension

Anxiety and tension is a natural part of cancer adjustment, continuing from diagnosis to long after recovery. Thus, a stress reduction intervention such as MBSR may be particularly suitable for cancer patients. Evidence suggests that although it is not a goal, relaxation is a common consequence of mindfulness practice (Kabat-Zinn, 1998). The finding of reduced tension following the MBSR group in the current study lends support to previous research that found reduced levels of state anxiety following an MBSR intervention (Speca et al., 2000; Tacon et al., 2004). Anxiety in cancer patients is usually attributed to fear of recurrence, tolerating the uncertainty of the future and concerns regarding adverse effects of treatment. This finding is particularly important as anxiety is very prevalent amongst cancer patients and interventions which can reduce such anxiety could significantly enhance their quality of life.

4.2.4.2 Depression

Depression is one of the most frequently reported psychological symptoms for cancer and the current study found that it significantly reduced in the MBSR group relative to controls. Yet, it was the one mood state that post hoc analysis did not find a significant improvement on. This may suggest that the effect was not particularly strong. Mindfulness-Based Cognitive Therapy (MBCT) already has a good evidence base for effectively reducing depression (Teasdale et al., 2000). However, in accordance with this study, Speca et al. (2000) also found a significant reduction in depression in breast cancer patients following an MBSR intervention. Thus, it would seem it is not just MBCT that can help reduce depressive symptoms but further prospective research is warranted to explore the role of MBSR in depression and relapse.

4.2.4.3 Anger

The current study found MBSR to effectively reduce anger scores relative to controls which is in accordance with findings by Speca et al. (2000). Awareness is the crucial element in learning how to not react to stress reactions. Responding mindfully to change and loss seemed to make a difference to the perception of having cancer, as participants in the MBSR group tended to view cancer as an event rather than as part of them and stated feeling less irritable than before the intervention. By being mindful, it seems having a diagnosis of cancer can be viewed as an opportunity to learn and grow rather than feel resentful.

4.2.4.4 Vigour

The current study found a significant increase in vigour in the MBSR group following the intervention relative to controls, which is similar to findings by Speca et al. (2000). Thus, there is a growing evidence base to suggest that MBSR can help increase vigour in cancer patients which is encouraging given the associated side effects of cancer treatment such as exhaustion. Yoga is an effective technique for developing flexibility and increased energy levels. Also, deep breathing exercises encourage participants to breathe in energy, vitality and renewal and breathe out any tension or holding. In this way, the body can feel more energised and consequently, less tense.

4.2.4.5 Fatigue

By increasing vigour, it follows that MBSR should decrease levels of fatigue. During MBSR practice, participants are encouraged to imagine feelings of fatigue flow out the body with each out breath. This study found a significant reduction in fatigue, however, Speca et al. (2000) did not find a significant change in fatigue scores. Hence, this study provides initial evidence that MBSR may help reduce fatigue in breast cancer patients. Similarly, these results suggest MBSR can help ease chemotherapy related fatigue which is certainly worthy of further research.

4.2.4.6 Confusion

Meditation has been associated with developing clarity and insight (Kabat-Zinn et al., 1998). Potentially, the more an individual is able to calm the torrent of thoughts in the mind, the more able they are to see other ways of responding to any given situation. Meditation also has a direct effect on the physiological effects of stress (Carlson et al.,

2004). Thus, it may help reduce the effects of stress upon concentration and confusion. In accordance with findings by Speca et al. (2000), this study also found a significant reduction in confusion following the MBSR intervention. This is in line with evidence that meditation can enhance alert attention (Kabat-Zinn, 1990), particularly as it can help develop flexibility of attention and concentration.

4.2.5 Relationship between distress, mindfulness and coping

In line with previous research, this study demonstrated an inverse association between distress and mindfulness. Brown & Ryan (2003) demonstrated that higher levels of mindfulness were related to declines in mood disturbance and stress in a small sample of cancer patients. Carlson & Brown (2005) also found higher mindfulness scores were related to lower mood disturbance and stress in an oncology population. They concluded that lower levels of psychological well being may, in part, be due to lower levels of mindfulness. This is not a surprising finding given that distress is likely to result in patients having fewer attentional resources, particularly when going through the immediate crisis of diagnosis and treatment. However, there is not necessarily a cause and effect relationship between mindfulness and distress and there are likely to be mediating variables involved such as social support, attention or relaxation.

It was expected that there may also have been an inverse relationship between distress and the coping strategies fighting spirit, problem focused coping and acceptance, but this was not the case in the current study. However, statistically significant associations between distress and anxious preoccupation, helpless-hopeless and avoidance were found. Although no significant changes in any of the coping strategies were found following the

MBSR group, coping may have been mediating the relationship between mindfulness and distress. Thus, rather than investigating coping as an independent variable, perhaps research should explore it further as a mediating or moderating variable. The lack of statistical changes could also be because coping was not well enough measured.

The literature on coping suggests that patients tend to use multiple coping strategies and these processes change over time (Glanz & Lerman, 1992). Folkman & Lazarus (1980) postulated that people who have had cancer use a large repertoire of behaviours to cope flexibly with any one threat, rather than rigidly adhering to a particular coping style. Thus, in addition to the conceptual problems in trying to define specific coping strategies, it seems coping is a difficult construct to try to measure.

4.2.6 Demographic Variables

The women in the intervention group and the control group were comparable in terms of every demographic variable other than treatment. This suggests that the two groups were well matched in terms of age, education, marital status and employment. Women in the control group were twice as likely to have had a lumpectomy and women in the MBSR group were almost three times as likely to have completed treatment. This difference could, in part, explain the difference in distress levels between the two groups at post-intervention and follow-up as the literature suggests that distress tends to be highest nearer diagnosis (Carver et al., 1993). Thus, it could be argued that participants in the control group had higher levels of distress as only 14% had finished treatment relative to 43% in the MBSR group. However, distress scores for the MBSR and control groups were almost identical at baseline. Thus, the reduction in distress for the MBSR group following the

intervention seems more likely to be due to the intervention than due to their relative stage of treatment.

There is consistent evidence in the literature to suggest that younger age predicts greater distress in cancer patients (Stanton et al, 2002; National Breast Cancer Centre, 2003). Accordingly, this study found an association between age and distress suggesting that younger women rated higher levels of distress. This may be due to having many commitments and competing responsibilities such as working and caring for a young family.

4.3 Possible Explanations for the Research Findings

4.3.1 Meditation is only effective for some psychosocial factors

Research has demonstrated a clear link between MBSR and psychosocial factors such as stress, sleep and distress (Specia et al., 2000; Carlson et al., 2003; Shapiro et al., 2003). This study lends support to the latter variable, distress. The absence of significant changes in coping strategies in the MBSR group may be due to the possibility that mindfulness meditation lacks efficacy in changing these forms of coping. Although attempting to measure coping strategies (situational coping), perhaps there was some overlap in the current study between measuring coping strategies and coping styles (dispositional coping) which would be harder to change, or at least unlikely to change in the short-term. However, Tacon et al. (2004) and (2005) found significant and beneficial changes for mental adjustment to breast cancer, specifically in relation to improvements in helplessness and anxious preoccupation responses.

4.3.2 The teaching method

The intervention used in this study was based on the original MBSR programme by Kabat-Zinn (1990) and the programme that Speca et al. (2000) specifically adapted for cancer patients. However, the standard MBSR intervention is eight 2-hour sessions, and this study adapted it to six 90-minute sessions. Thus, the intervention may be less efficacious as the content was reduced by seven hours. However, this was still long enough to evidence a significant reduction in distress and a significant increase in mindfulness scores. It is particularly encouraging that changes were made over a short period of time and improved over the three-month follow-up period. Speca et al. (2000) also used a shorter content which consisted of seven 90-minute sessions (10.5 hours in total) and found statistically significant results. The literature reports varying lengths of MBSR interventions, ranging from four to eight sessions and lasting between 45 minutes to 2.5 hours each. It is difficult to meaningfully evaluate the impact of such variations given the further differences in sample characteristics, measures used and follow-up durations between studies.

It was decided to condense the intervention specifically for the needs of the cancer patients as initial feedback had suggested that a longer group would have been too time consuming and labour intensive for patients while undergoing treatment. However, many participants had to travel to Edinburgh on a daily basis to receive radiotherapy treatment and still managed to attend the majority of sessions. Therefore the length and number of sessions may not have been as substantial an issue as originally anticipated. This reflects anecdotal reports of participants requesting additional sessions to consolidate their skills

and maintain practice as they found it easier in a group format. A longer formal teaching duration may have been beneficial to maintain motivation.

It may be that vital elements, necessary for meditation effectiveness, were unknowingly omitted from the condensed intervention. It was decided to exclude the walking meditation as the groups were held in hospital grounds with limited space both within and outside of the buildings. On the advice of experienced mindfulness teachers, a metta meditation was introduced instead, which encourages participants to direct healing energy toward others as well as toward their own body. The full day retreat was also omitted due to time constraints and the fact that the majority of patients were still undergoing treatment.

4.3.3 Facilitator inexperience

Evaluation of the efficacy of any treatment requires that it be adequately administered (Kazdin, 1994). With this in mind, the inexperience of the facilitator (the author) may have affected the results of the study. This issue would need to be considered when comparing the results of the current study with studies where the facilitators have had extensive experience and training in mindfulness approaches. The majority of studies do not describe facilitator training but there seems to be a general consensus that in order to be able to teach MBSR effectively, facilitators should have a combination of MBSR training, relevant supervised experience in facilitating groups and experience of working with the relevant patient group (Specia et al., 2006). In addition, Baer (2003) suggests that integrity of treatment implementation can be enhanced through rigorous training and regular supervision of therapists.

The facilitator for the current study had eight years experience practicing mindfulness based techniques, such as relaxation and yoga, and had six years of clinical experience running groups within NHS settings, particularly stress reduction related groups. Both of the co-facilitators had no formal training but had a personal interest in mindfulness. The co-facilitator for the Maggie's group was trained in psychological therapy and ran all of the groups, such as the 'living with less stress' course. The co-facilitator for the Dunfermline group was a Clinical Psychologist who had extensive experience working in health settings and group work. The facilitators inexperience did however have ecological validity as whenever new treatment approaches are applied in healthcare settings, there would inevitably be an initial period where the teachers are novices and require time to develop their skills.

Nonetheless, due to a lack of training and experience it may be that the essence of mindfulness was not embodied sufficiently in the classes to effect changes in coping strategies. However, mindfulness levels significantly increased following the MBSR group compared to the control group, hence it would seem that the teacher was able to impart knowledge of mindfulness effectively. This may be because the facilitator had extensive experience working with cancer patients and developing group skills such as creating a safe environment, holding and containing group dynamics and keeping the group engaged while teaching techniques didactically. There appears to be an emphasis on the importance of the facilitator being an engaged practitioner of mindfulness, being able to embody the practice as they teach. Segal et al. (2002) stated that if the facilitator is not mindful as they teach, participants learning will be limited. Thus, the facilitator practised mindfulness daily throughout the study to ensure the mindfulness skills were integrated

with the range of other skills to develop an inner blending of an experiential and conceptual understanding of the approach.

4.3.4 Social support

Sharing in a supportive group format with others who have a similar diagnosis can create a crucial sense of community which can help to normalise the cancer experience (Spiegel et al., 1981). This sense of connection was reflected in one group by referring to themselves as “our sisters in cancer”. As social support has been shown to improve adjustment and promote emotional well-being in women with breast cancer (Irvine et al., 1991), this could be a mediating variable in the significant reduction in distress levels found in the current study.

The dual benefit of giving and receiving support which commonly occurs in group interventions has been called the “helper-therapy principle” (Riessman, 1965). It is proposed that patients not only benefit from learning how others cope with the stresses of breast cancer but they can also gain a sense of achievement by providing information which can help others in a similar situation. Anecdotal reports suggested that many participants felt better when they could help someone else rather than constantly be preoccupied with their own problems. Thus, it is possible that one of the effective components of MBSR, like any other group intervention, is this shared sense of social and emotional support.

4.3.5 Timing of Intervention

Learning a new skill, such as meditation, under crisis conditions must be very difficult. Thus, the timing and context in which the intervention is offered to patients is vital to ensure that it is accessible to patients who may benefit from it. Anecdotal reports suggested that many participants who had completed treatment had wished the intervention had been available to them while they were going through treatment as many found that the most stressful time. Others felt that they could spend more time practicing now that their treatment had finished. Thus, depending on the phase of treatment, participants may not have benefited as much as possible from the intervention. Now that the group is being piloted at the Maggie's Centre in Kirkcaldy, with a view to it being rolled out across the other centres, patients will be able to decide to opt in whenever they feel it would be most beneficial to them.

4.4 Strengths and Limitations of Study

4.4.1 Statistical power analysis

At baseline, the sample size obtained should have been sufficient to achieve statistical power according to Cohen's (1992) tables which were used to estimate that a study sample of 52 participants (26 in each group) would be required to achieve a power of 0.8 with an alpha of 0.05 and a large effect size. However, unfortunately by post-intervention the control group had dropped to just twenty one participants. Thus, the sample size may have been too small to achieve adequate statistical power.

By follow-up, the number of participants in the control group dropped to five which was partly due to time constraints. In total, 14 participants from the control group attended the

MBSR group which was offered to them at the end of the study. However, six did not complete the baseline measures and three submitted them once the group had started, thus the measures could not be used. The remaining seven participants from the control group had returned back to work by the time the intervention was offered to them. For the participants who had opted in at the study's inception in June, it was a ten month wait, thus the higher number of drop out is not surprising.

4.4.2 Randomisation

To ensure each participant had an equal chance of being assigned to either group, participants were randomly allocated using a computer package to generate a random number table consisting of either A (MBSR group) or B (control group). The experimenter recruited participants, randomly allocated them to a group, sent out and scored the questionnaires and delivered the intervention. Therefore, it was not possible to ensure masking which would have strengthened the objectivity of the researcher. However, the researcher was not biased in terms of preconceived notions of "expected" outcomes as the questionnaires were not scored until the end of the study. It cannot be ruled out that the participants may have tried to "fake good" scores on the questionnaires knowing that the facilitator of the intervention was going to score the questionnaires.

All scores at baseline were similar across groups, indicating that randomisation had resulted in groups well matched on mindfulness, coping and distress scores. Thus, it seems reasonable to suppose that the differences obtained in distress and mindfulness scores post-intervention were attributable to the intervention.

4.4.3 Design of study

A clear strength of this study was the use of a randomised controlled trial as it minimizes confounding variables (Viera et al. (2007). The majority of MBSR studies have not included a control group and thus the inclusion of a waiting-list control group was a particular strength of the current study. However, there was no opportunity to include a therapeutic comparison group, in order to determine the relative efficacy of the mindfulness intervention. Without this information, it is difficult to determine whether mindfulness is as effective as traditional therapies. A clear limitation of this study was the lack of participants in the control group at follow-up which restricted statistical analysis as it was not possible to complete a mixed ANOVA for all 3 time points.

A further strength of the current study was that it incorporated a 3 month follow-up assessment, particularly as the full effects of MBSR may only be measurable over the longer term as participants' skills develop. In MBSR, coping skills are presented in the larger context of everyday life, thus the emphasis is on developing greater self acceptance which can be built on and developed throughout life. However, a change in attitudes and lifestyle can take a long time to truly alter so ideally a one-year follow-up would have been used to establish this. Eight participants in the intervention group did not complete follow-up assessments, thus the possibility that they did not sustain any benefit cannot be ruled out.

As research suggests that distress usually starts to decline within a year after diagnosis and treatment (Glanz & Lerman, 1992), this study recruited women diagnosed within the last year. Ideally women would have been recruited sooner after diagnosis but a year was used

to maximise recruitment. All the other studies in MBSR recruited patients at any phase of treatment, with the exception of Shapiro et al. (2003) who only recruited women who had completed treatment. The other studies also recruited participants at any stage of the illness, whereas the current study only recruited patients without distant metastases. Hence, this study is the first to demonstrate the effectiveness of MBSR in this specific cohort of breast cancer patients. Most previous research has involved individuals with differing types of cancer (e.g. samples comprising a mixture of breast cancer and prostate cancer patients). The current study selected a more homogeneous breast cancer sample, thus reducing the number of confounding variables. Additionally, this is the first study to investigate the effects of mindfulness on psychosocial factors such as emotion and problem focused coping. It is also the first randomised controlled trial to be conducted on mental adjustment to cancer in an MBSR intervention.

4.4.4 Intention-to-treat analysis

ITT analysis based on data for the 59 participants at baseline, post-intervention and follow-up (conducted by carrying forward the last observation) did not demonstrate any changes to the results. This analysis is more conservative as it avoids the problems created by omitting participants who drop out of a study which can introduce bias and may overestimate clinical effectiveness. However, the same general results were obtained, which suggests that the significant findings found in this study for both the mindfulness and distress scores may not have been overestimated.

4.4.5 Biased population

Of the 165 breast cancer patients who met the inclusion criteria for the study and were asked to participate, 41 per cent opted in. As they were self-selected volunteers, they were more likely to be motivated or may have had previous experience with meditation. This may have resulted in a more highly motivated sample of participants than if a random selection of patients had participated. Hence, generalisability of findings may be restricted in terms of motivational factors, but the findings from this study do suggest that MBSR can be beneficial to patients who express a desire to participate. In addition, despite the high drop out rate in the control group, a strength of this study was the low drop out rate of 13 per cent in the intervention group. This low drop out rate could be taken as further evidence that patients who are motivated and enrol in an MBSR group are likely to complete them and then may continue to practice and benefit from mindfulness after the group ends.

The participants who opted into the study may have differed on psychosocial or personality variables relative to those who chose not to attend. Bishop (2002) proposed that personality traits will influence recruitment, compliance and the ability to use meditation to reduce stress. For example, Delmonte (1986) found that people who chose to practice meditation had greater psychological problems, were older, had a negative self perception and had greater expectations from practicing meditation. As there is no baseline data for participants who opted out of the study it can only be hypothesised that perhaps they had no interest in learning new skills or may have been too stressed. Some anecdotal evidence obtained from discussions with the breast care nurses suggested that some patients viewed meditation as an unconventional 'alternative' activity. Many people

clearly still have fixed pre-existing ideas regarding the nature of meditation and its origins. However, this may change as Eastern and Western psychologies increasingly integrate. There is certainly a growing interest and indeed evidence base in favour of psychoneuroimmunology and the interconnection between body and mind.

The sample of breast cancer patients in this study were all white females from one geographical area which reduces generalisability of findings to other ethnic groups as well as male cohorts. As discussed earlier, it would be beneficial to isolate a specific phase of treatment, either at diagnosis or after treatment, to try to establish when MBSR may be most useful for patients.

4.4.6 Expectancy effects

Although the control group were not given any mindfulness instruction throughout the study, they were expecting to participate in the group once the study was completed. This may not only have created expectancy effects, but some participants may have read about mindfulness and developed their interest while waiting to start the group which could have reduced the differences between the two groups. However, mindfulness scores for the control group had slightly reduced by post-intervention, thus being primed with the knowledge that they would probably be taking part in a mindfulness group in the near future did not seem to affect their mindfulness scores. Participants in the control group may have felt disappointed to be in the waiting-list control group and this may have affected their scores. Thus, changes in the measured outcomes may not be directly attributable to meditation as there was likely to be expectancy effects.

4.4.7 Questionnaire measures

The lack of significant results for coping strategies was at variance with participants' subjective reports of change. After attending the group, participants described a greater ability to cope with stress and felt they had accepted their diagnosis better. Thus, it is possible that the coping questionnaires were either not sensitive enough to detect subtle changes in the intervention group or did not measure the types of changes in coping that this group experienced.

The majority of previous studies have not measured the construct of mindfulness, thus there is no way of assessing whether MBSR actually facilitates change in this quality of consciousness. It is important to use a measure of mindfulness as otherwise, it cannot be determined if it is mindfulness itself that enhances psychological well being. The present study used the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) and found a significant increase in mindfulness which suggests it is a sensitive measure to detect treatment versus control condition effects.

The use of self report questionnaires could be thought of as a limitation but they were specifically chosen as they had all been validated with cancer populations. Thus, in order to compare results to previous research the same measures were employed. However, participants commented that the Profile of Mood States (POMS; McNair et al. 1971) was arduous to complete, particularly when undergoing treatment. The anxious preoccupation subscale of the Mental Adjustment to Cancer Scale (MAC; Watson et al., 1988) had low reliability (Cronbach's Alpha = 0.53) which may have affected the lack of significant findings for this particular coping strategy.

4.4.8 Challenges in evaluating MBSR

Kabat-Zinn (2003) cautioned that the recent increasing interest in MBSR as a clinical approach may lead to it being viewed as a technique that can be used generically without a good understanding of the problem or the inherent mechanisms of change. Mindfulness certainly develops qualities which are difficult to evaluate empirically, such as awareness, insight, wisdom, and compassion. This study did not attempt to measure any of these variables, but there is a growing evidence base of qualitative studies which focuses upon mechanisms and processes of mindfulness (Shapiro et al., 2006; Dobkin, 2008). MacKenzie et al. (2005) suggested that knowledge of process factors may optimise MBSR programme adherence. However, it has been argued that it is almost impossible to identify specific elements that mediate outcomes and, even if it was possible, there is little evidence to suggest that one set of specific elements is superior to another (Wampold, 1997).

4.4.9 Anecdotal Reports

Whilst the current study did not include measures of process variables, anecdotal reports were obtained throughout the groups. Common themes included learning to be more conscious of breathing, finding the techniques relaxing and learning to live in the moment, and trying not to dwell on the past or worry about the future. Participants often referred to being stuck in automatic pilot and finding it helpful to slow down. Several stated that remembering that thoughts are not facts was particularly beneficial when trying not to worry about their illness and prognosis. Participants found the mini-relaxation exercises helpful, predominantly in stressful situations such as in the waiting room prior to a hospital appointment.

Preferences for each technique varied amongst individuals but the vast majority stated preferring the body scan, reporting they found it relaxing and it helped to improve their sleep. Some preferred the sitting meditation as they felt that it gave them more energy. Several stated enjoying the yoga but felt that it was difficult practising on their own without instruction. Thus, they chose to join a yoga class. A few individuals reported finding the metta meditation left feelings of happiness and helped them to have a more positive attitude. Others felt the group had helped them to feel more confident and to get their priorities in order, sorting out what really matters and what does not.

4.5 Future Research

Further studies are needed to determine with confidence the effectiveness of MBSR relative to other interventions and its cost effectiveness and acceptability. Research should try to better understand the mediating and moderating factors and unique benefits of MBSR. Further qualitative research should help to determine active ingredients and mechanisms of action in MBSR. Qualitative elements regarding satisfaction, commitment to practise and personal experience would add to the increasing body of evidence of MBSR as a supportive therapy in cancer care.

There is clearly a need for randomised controlled trials with larger samples and longer follow-up periods. It would be more useful in determining the long term effects of mindfulness meditation as attitudinal change can take a long time to develop. It would be beneficial to determine when MBSR would be most useful for cancer patients (e.g. at diagnosis or after treatment). The construct of mindfulness itself should routinely be

evaluated for change in MBSR studies. As it is assumed that the mechanisms which effect change are attributed to mindfulness, it seems prudent to measure this effect. Explicit guidelines on MBSR facilitator training would help to ensure programmes are being delivered optimally. Future studies are also needed to explore the relationship between mindfulness and coping with a cancer diagnosis to ascertain whether there is a role for mindfulness in helping patients adjust to their illness.

Overall, the empirical research regarding the use of MBSR with cancer patients is compelling but preliminary. Thus, replication of studies is warranted, particularly using rigorous design and large samples.

4.6 Summary and Conclusions

The aim of this study was to evaluate the effectiveness of an MBSR intervention on adjustment to breast cancer. This study demonstrated a significant decrease in distress and an increase in mindfulness scores in the MBSR group relative to a matched control group, but did not find changes in any of the six coping strategies investigated. This research was restricted in terms of resources and time, which resulted in a smaller sample size than would be required for statistical power to detect some changes.

This study adds to the evidence base demonstrating the efficacy of MBSR with cancer patients. Overall, evidence suggests that MBSR is an effective approach in reducing distress amongst cancer patients. This study and other studies also suggest that benefits gained from MBSR interventions continue beyond the actual intervention, with lower levels of distress observed at follow-up than post-intervention. This suggests that

participants are able to incorporate the skills learnt during the intervention into their everyday lives.

It is hoped that this study will stimulate further empirical trials to assess the efficacy of MBSR within oncology, particularly given the unanimous positive feedback from participants and its cost effectiveness within under resourced NHS settings.

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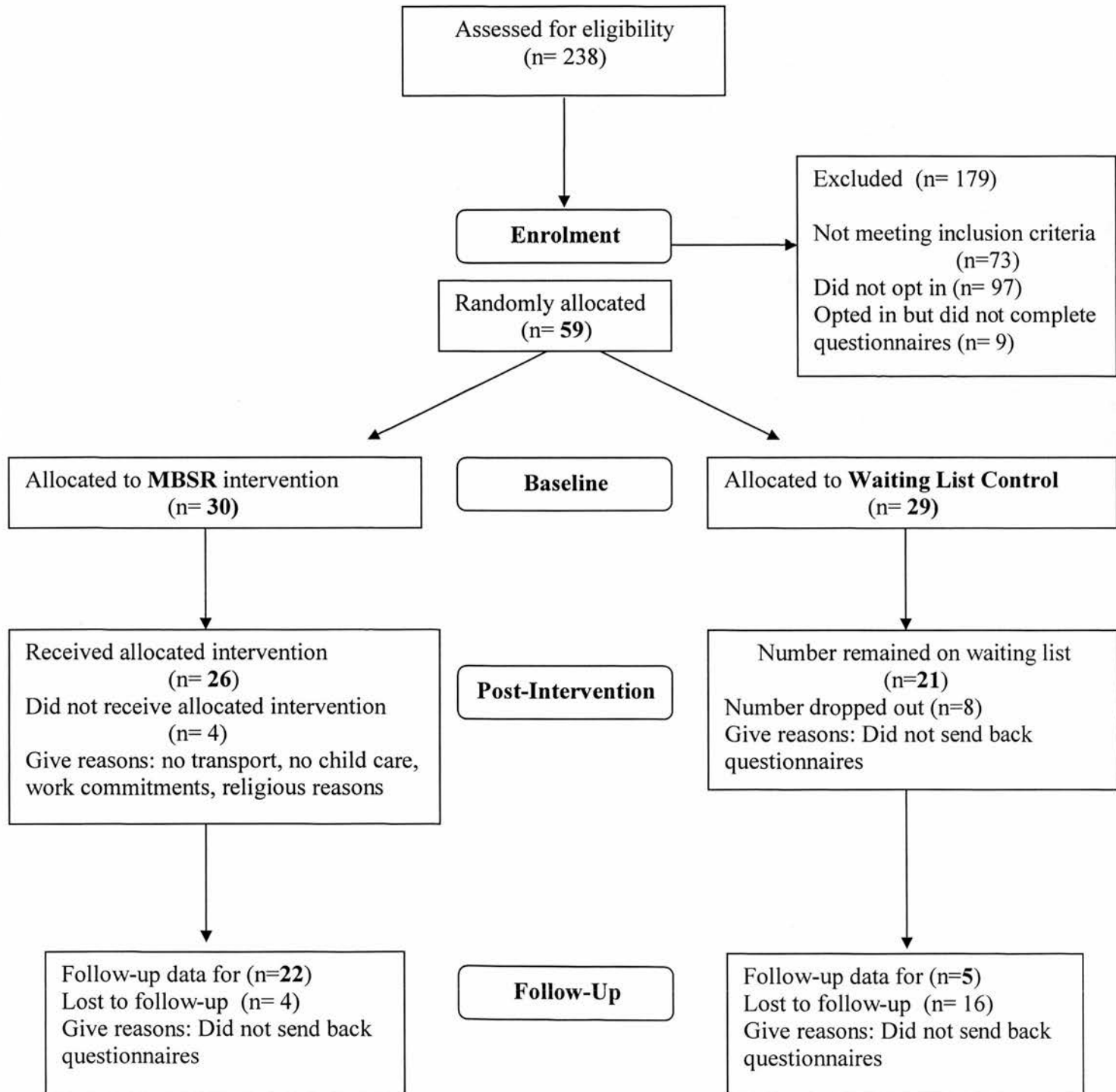
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Appendices

Appendix 1

Flowchart

Flowchart of Protocol



Appendix 2

Demographic Questionnaire

Participant No:

Demographics Questionnaire

1. What is your Date of Birth? ____ / ____ / ____

2. How many years of education have you had? (e.g. left school at 15 years old = about 10 years)

_____ years

3a. What is your current marital status? (e.g. single, separated, co-habiting, married, divorced, widowed)

3b. Who lives with you at home? _____

4. What is your occupation? _____

5. What is your current employment status?

6. How many months is it since you have been diagnosed with breast cancer?

_____ months

7a. What treatment have you had?

7b. Are you still undergoing treatment?

Yes ☐

No ☐

Appendix 3

Mental Adjustment to Cancer Scale (MAC)

MENTAL ADJUSTMENT TO CANCER SCALE (MAC)

INSTRUCTIONS: A number of statements are given below which describe people's reactions to having cancer. Please circle the appropriate number to the right of each statement, indicating how far it applies to you at present. For example, if the statement definitely does **not** apply to you, then you should circle 1 in the first column.

	<i>Definitely does not apply to me</i>	<i>Does not apply to me</i>	<i>Applies to me</i>	<i>Definitely applies to me</i>
1. I have been doing things that I believe will improve my health e.g. changed my diet.	1	2	3	4
2. I feel I can't do anything to cheer myself up.	1	2	3	4
3. I feel that problems with my health prevent me from planning ahead.	1	2	3	4
4. I believe that my positive attitude will benefit my health.	1	2	3	4
5. I don't dwell on my illness.	1	2	3	4
6. I firmly believe that I will get better.	1	2	3	4
7. I feel that nothing I can do will make a difference.	1	2	3	4
8. I've left it all to my doctors.	1	2	3	4
9. I feel that life is hopeless.	1	2	3	4
10. I have been doing things that I believe will improve my health e.g. exercising.	1	2	3	4
11. Since my cancer diagnosis, I now realize how precious life is and I'm making the most of it.	1	2	3	4
12. I've put myself in the hands of God.	1	2	3	4
13. I have plans for the future e.g. holiday, jobs, housing.	1	2	3	4
14. I worry about the cancer returning or getting worse.	1	2	3	4
15. I've had a good life; what's left is a bonus.	1	2	3	4
16. I think my state of mind can make a lot of difference to my health.	1	2	3	4
17. I feel that there is nothing I can do to help myself.	1	2	3	4



	<i>Definitely does not apply to me</i>	<i>Does not apply to me</i>	<i>Applies to me</i>	<i>Definitely applies to me</i>
18. I try to carry on my life as I've always done.	1	2	3	4
19. I would like to make a contact with others in the same boat.	1	2	3	4
20. I am determined to put it all behind me.	1	2	3	4
21. I have difficulty in believing that this happened to me.	1	2	3	4
22. I suffer great anxiety about it.	1	2	3	4
23. I am not very hopeful about the future.	1	2	3	4
24. At the moment I take one day at a time.	1	2	3	4
25. I feel like giving up.	1	2	3	4
26. I try to keep a sense of humour about it.	1	2	3	4
27. Other people worry about me more than I do.	1	2	3	4
28. I think of other people who are worse off.	1	2	3	4
29. I am trying to get as much information as I can about cancer.	1	2	3	4
30. I feel that I can't control what is happening.	1	2	3	4
31. I try to keep a very positive attitude.	1	2	3	4
32. I keep quite busy, so I don't have time to think about it.	1	2	3	4
33. I avoid finding out more about it.	1	2	3	4
34. I see my illness as a challenge.	1	2	3	4
35. I feel fatalistic about it.	1	2	3	4
36. I feel completely at a loss about what to do.	1	2	3	4
37. I feel very angry about what has happened to me.	1	2	3	4
38. I don't really believe I had cancer.	1	2	3	4
39. I count my blessings.	1	2	3	4
40. I try to fight the illness.	1	2	3	4

Thank you for taking the trouble to complete this scale!

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Appendix 4

The Coping Orientation to Problems Experienced (COPE)

COPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by choosing one number for each, using the response choices listed just below.

1 = I usually don't do this at all.

2 = I usually do this a little bit.

3 = I usually do this a medium amount.

4 = I usually do this a lot.

Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no 'right' or 'wrong' answers, so choose the most accurate answer for YOU – not what you think 'most people' would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1. I try to grow as a person as a result of the experience.
2. I turn to work or other substitute activities to take my mind off things.
3. I get upset and let my emotions out.
4. I try to get advice from someone about what to do.
5. I concentrate my efforts on doing something about it.
6. I say to myself "this isn't real".
7. I put my trust in God.
8. I laugh about the situation.
9. I admit to myself that I can't deal with it, and give up trying.
10. I restrain myself from doing anything too quickly.
11. I discuss my feelings with someone.
12. I use alcohol or drugs to make myself feel better.
13. I get used to the idea that it happened.
14. I talk to someone to find out more about the situation.
15. I keep myself from getting distracted by other thoughts or activities.
16. I daydream about things other than this.
17. I get upset, and am really aware of it.
18. I seek God's help.
19. I make a plan of action.
20. I make jokes about it.

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|---|--------------------------|
| 21. I accept that this has happened and that it can't be changed. | <input type="checkbox"/> |
| 22. I hold off doing anything about it until the situation permits. | <input type="checkbox"/> |
| 23. I try to get emotional support from friends and relatives. | <input type="checkbox"/> |
| 24. I just give up trying to reach my goal. | <input type="checkbox"/> |
| 25. I take additional action to try to get rid of the problem. | <input type="checkbox"/> |
| 26. I try to lose myself for a while by drinking alcohol or taking drugs. | <input type="checkbox"/> |
| 27. I refuse to believe that it has happened. | <input type="checkbox"/> |
| 28. I let my feelings out. | <input type="checkbox"/> |
| 29. I try to see it in a different light, to make it seem more positive. | <input type="checkbox"/> |
| 30. I talk to someone who could do something concrete about the problem. | <input type="checkbox"/> |
| | |
| 31. I sleep more than usual. | <input type="checkbox"/> |
| 32. I try to come up with a strategy about what to do. | <input type="checkbox"/> |
| 33. I focus on dealing with this problem and, if necessary, let other things slide a little. | <input type="checkbox"/> |
| 34. I get sympathy and understanding from someone. | <input type="checkbox"/> |
| 35. I drink alcohol or take drugs, in order to think about it less. | <input type="checkbox"/> |
| 36. I kid around about it. | <input type="checkbox"/> |
| 37. I give up the attempt to get what I want. | <input type="checkbox"/> |
| 38. I look for something good in what is happening. | <input type="checkbox"/> |
| 39. I think about how I might best handle the problem. | <input type="checkbox"/> |
| 40. I pretend that it hasn't really happened. | <input type="checkbox"/> |
| | |
| 41. I make sure not to make matters worse by acting too soon. | <input type="checkbox"/> |
| 42. I try hard to prevent other things from interfering with my efforts at dealing with this. | <input type="checkbox"/> |
| 43. I go to the cinema or watch television, to think about it less. | <input type="checkbox"/> |
| 44. I accept the reality of the fact that it happened. | <input type="checkbox"/> |
| 45. I ask people who have had similar experiences what they did. | <input type="checkbox"/> |
| 46. I feel a lot of emotional distress and I find myself expressing those feelings a lot. | <input type="checkbox"/> |
| 47. I take direct action to get around the problem. | <input type="checkbox"/> |
| 48. I try to find comfort in my religion. | <input type="checkbox"/> |
| 49. I force myself to wait for the right time to do something. | <input type="checkbox"/> |
| 50. I make fun of the situation. | <input type="checkbox"/> |
| | |
| 51. I reduce the amount of effort I'm putting into solving the problem. | <input type="checkbox"/> |
| 52. I talk to someone about how I feel. | <input type="checkbox"/> |
| 53. I use alcohol or drugs to help me get through it. | <input type="checkbox"/> |
| 54. I learn to live with it. | <input type="checkbox"/> |
| 55. I put aside other activities in order to concentrate on this. | <input type="checkbox"/> |
| 56. I think hard about what steps to take. | <input type="checkbox"/> |
| 57. I act as though it hasn't even happened. | <input type="checkbox"/> |
| 58. I do what has to be done, one step at a time. | <input type="checkbox"/> |
| 59. I learn something from the experience. | <input type="checkbox"/> |
| 60. I pray more than usual. | <input type="checkbox"/> |

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Appendix 5

The Profile of Mood States (POMS)

Profile of Mood States

Directions: Describe HOW YOU FEEL RIGHT NOW by checking one space after each of the words listed below:

FEELING	Not at all	A little	Mod.	Quite a bit	Extremely
Friendly	1	2	3	4	5
Tense	1	2	3	4	5
Angry	1	2	3	4	5
Worn Out	1	2	3	4	5
Unhappy	1	2	3	4	5
Clear-headed	1	2	3	4	5
Lively	1	2	3	4	5
Confused	1	2	3	4	5
Sorry for things done	1	2	3	4	5
Shaky	1	2	3	4	5
Listless	1	2	3	4	5
Peeved	1	2	3	4	5
Considerate	1	2	3	4	5
Sad	1	2	3	4	5
Active	1	2	3	4	5
On edge	1	2	3	4	5
Grouchy	1	2	3	4	5
Blue	1	2	3	4	5
Energetic	1	2	3	4	5
Panicky	1	2	3	4	5
Hopeless	1	2	3	4	5
Relaxed	1	2	3	4	5
Unworthy	1	2	3	4	5
Spiteful	1	2	3	4	5
Sympathetic	1	2	3	4	5
Uneasy	1	2	3	4	5
Restless	1	2	3	4	5
Unable to concentrate	1	2	3	4	5
Fatigued	1	2	3	4	5

Helpful	1	2	3	4	5
Annoyed	1	2	3	4	5
Discouraged	1	2	3	4	5
Resentful	1	2	3	4	5
Nervous	1	2	3	4	5
Lonely	1	2	3	4	5
Miserable	1	2	3	4	5
Muddled	1	2	3	4	5
Cheerful	1	2	3	4	5
Bitter	1	2	3	4	5
Exhausted	1	2	3	4	5
Anxious	1	2	3	4	5
Ready to fight	1	2	3	4	5
Good-natured	1	2	3	4	5
Gloomy	1	2	3	4	5
Desperate	1	2	3	4	5
Sluggish	1	2	3	4	5
Rebellious	1	2	3	4	5
Helpless	1	2	3	4	5
Wearry	1	2	3	4	5
Bewildered	1	2	3	4	5
Alert	1	2	3	4	5
Deceived	1	2	3	4	5
Furious	1	2	3	4	5
Effacious	1	2	3	4	5
Trusting	1	2	3	4	5
Full of pep	1	2	3	4	5
Bad-tempered	1	2	3	4	5
Worthless	1	2	3	4	5
Forgetful	1	2	3	4	5
Carefree	1	2	3	4	5
Terrified	1	2	3	4	5
Guilty	1	2	3	4	5
Vigorous	1	2	3	4	5
Uncertain about things	1	2	3	4	5
Bushed	1	2	3	4	5

Appendix 6

The Mindfulness Attention Awareness Scale (MAAS)

MAAS

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

	1	2	3	4	5	6
	Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never
I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6

I drive places on 'automatic pilot' and then wonder why I went there.

1	2	3	4	5	6
---	---	---	---	---	---

I find myself preoccupied with the future or the past.

1	2	3	4	5	6
---	---	---	---	---	---

I find myself doing things without paying attention.

1	2	3	4	5	6
---	---	---	---	---	---

I snack without being aware that I'm eating.

1	2	3	4	5	6
---	---	---	---	---	---

Appendix 7

Ethics Committee Approval Letter



Fife



Forth Valley



Tayside

Fife, Forth Valley & Tayside Research Ethics Service

Fife & Forth Valley Research Ethics Committee

Research Ethics Office

Level 9

Ninewells Hospital & Medical School

DUNDEE

DD1 9SY

Ms Lesley J Meiklejon
Trainee Clinical Psychologist
Fife Health Board
Clinical Psychology Department
Stratheden Hospital
Cupar
KY15 5RR

Date: 9 May 2007
Your Ref:
Our Ref: FB/07/S0501/6
Enquiries to: Miss Fiona Bain
Extension: Ninewells extension 32701
Direct Line: 01382 632701
Email: fionabain@nhs.net

Dear Ms Meiklejon

Full title of study: **The effect of a Mindfulness-Based Stress Reduction Programme on Adjustment to Breast Cancer.**
REC reference number: **07/S0501/6**

Thank you for your letter of 18 April 2007, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application		11 January 2007
Investigator CV		11 January 2007
Protocol	2	05 April 2007
Covering Letter		16 January 2007
Summary/Synopsis	1.0	11 January 2007
Letter from Sponsor		20 November 2006
Compensation Arrangements		28 July 2006
Questionnaire: Non-Validated Questionnaire - Demographics Questionnaire		
Questionnaire: Validated Questionnaire - MAAS		

Document	Version	Date
Questionnaire: Validated Questionnaire - Profile of Mood States		
Questionnaire: Validated Questionnaire - COPE		
Questionnaire: Validated Questionnaire - Mental Adjustment to Cancer Scale		
GP/Consultant Information Sheets	1.0	11 January 2007
Participant Information Sheet	2	05 April 2007
Participant Consent Form: Consent Form	1.0	11 January 2007
Response to Request for Further Information		18 April 2007

R&D approval

All researchers and research collaborators who will be participating in the research at NHS sites should apply for R&D approval from the relevant care organisation, if they have not yet done so. R&D approval is required, whether or not the study is exempt from SSA. You should advise researchers and local collaborators accordingly.

Guidance on applying for R&D approval is available from <http://www.rdforum.nhs.uk/rdform.htm>.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

Feedback on the application process

Now that you have completed the application process you are invited to give your view of the service you received from the National Research Ethics Service. If you wish to make your views known please use the feedback form available on the NRES website at:

<https://www.nresform.org.uk/AppForm/Modules/Feedback/EthicalReview.aspx>

We value your views and comments and will use them to inform the operational process and further improve our service.

07/S0501/6

Please quote this number on all correspondence

Yours sincerely,

Chair

Enclosures: Standard approval conditions

Copy to: Mrs Anne Fernon, The University of Edinburgh
NHS Fife R&D office

Appendix 8

Research and Development Approval Letter

Ms L Meiklejon
Clinical Psychology Dept
Stratheden Hospital
CUPAR KY15 5RR

Medical Director, Primary Care
Room 313
Hayfield House
Hayfield Road
KIRKCALDY
Fife KY2 5AH
Tel 01592 643355
www.show.scot.nhs.uk/fpct

Date 23 May 2007
Our Ref 07/S0501/6
Enquiries to Aileen Yell
Ext 5110
Email aileen.yell@faht.scot.nhs.uk

Dear Ms Meiklejon

Project Title: The effect of a mindfulness-based stress reduction programme on adjustment to breast cancer

Thank you for your application to carry out the above project.

Your project documentation has been reviewed for resource and financial implications for NHS Fife Primary Care Division and I am happy to inform you that Management Approval has been granted.

Details of our participation in this study will be included in quarterly returns to the National Research Register and annual returns we are expected to complete as part of our agreement with the Chief Scientist Office. The enclosed Research Registration Form has been prepared and should be checked, signed and returned together with the attached NRR Form to the R&D Office, Lynebank Hospital, Halbeath Rd, Dunfermline KY11 4UW. If you have any questions or need further information contact Amanda Wood, Research Coordinator on: 01383 623623 ext 5111 or at amanda.wood@faht.scot.nhs.uk

May I take this opportunity to remind you that all research undertaken in NHS Fife is managed strictly in accordance with the Research Governance Framework for Health & Community Care (<http://www.sehd.scot.nhs.uk/cso/>) and that all research should be carried out according to Good Clinical Practice (GCP). In order to comply with the RGF, the R&D Office are required to hold copies of all study protocols, ethical approvals and amendments for the duration of this study.

You will also be required to provide information in regard to monitoring and study outcomes, including a lay summary on completion of the research. I would like to wish you every success with your study and look forward to receiving a summary of the findings for dissemination once the project is complete.

Yours sincerely

DR STELLA CLARK
Medical Director, Primary Care
NHS Fife

Cc : Aileen Yell, Asst R&D Co-ordinator, NHS Fife, Lynebank Hospital, Dunfermline

Appendix 9

Director of Nursing Approval Letter

Ms Lesley Meiklejohn
Trainee Clinical Psychologist
Department of Clinical Psychology
Stratheden Hospital
CUPAR
Fife KY15 5RR

Date	18 April 2007
Your Ref	
Our Ref	CI/MF
Enquiries to	Mrs M Forrester
Extension	4071
Direct Line	01383 674071
Fax No	01383 624156
Email	caroline.inwood@faht.scot.nhs.uk

Dear Ms Meiklejohn

RE. RESEARCH ETHICS APPLICATION

Thank you for your letter dated 11 April 2007 requesting permission to involve the Breast Care Nurses in the recruitment of patients for your study "The Effect of a Mindfulness Based Stress Reduction Programme on Adjustment to Breast Cancer". I note that you have obtained the approval of Arlene Saunderson, Directorate Nurse Manager (Surgery).

I am therefore happy for you to progress with your study and would like to wish you every success with your project.

Yours sincerely

CAROLINE INWOOD
DIRECTOR OF NURSING, MIDWIFERY, THERAPIES AND REHABILITATION

Appendix 10

Participant Information Sheet

Participant Information Sheet

Research title

The effect of a Mindfulness Based Stress Reduction programme on adjustment to breast cancer.

We would like to invite you to participate in a research project. Before you decide if you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information and feel free to ask me if there is anything you are unclear about or if you would like further information.

Introduction

Mindfulness-Based Stress Reduction (MBSR) was developed by a meditation teacher and is time limited and patient centered. Its ultimate goal is to teach participants skills that they can apply proactively to their lives, including their illnesses, long after the programme ends. These skills include a variety of mindfulness techniques such as meditation, yoga, and a body awareness technique called the body scan. They are useful skills that can be practised by participants to reduce and cope with stress, promote relaxation and alleviate physical discomfort and emotional distress. Studies looking at the effects of the group have found improvements in a range of medical conditions, such as chronic pain, anxiety and depression. MBSR has also been shown to reduce stress, mood and sleep disturbance and enhance coping and well being in cancer patients.

What is the study about?

We are planning to do some research on MBSR which aims to improve participants adjustment to breast cancer. Receiving a diagnosis of breast cancer can result in feelings of anxiety and hopelessness about the future. It is hoped this study will benefit you by reducing any stress or emotional distress that you may be experiencing. It is also hoped that learning coping skills and sharing common experiences (if you wish to do so) will help you feel a greater sense of control over your life.

The research will form part of an educational project for a Doctorate in Clinical Psychology, University and East of Scotland NHS Clinical Psychology Training Course. It is hosted by NHS Fife, Fife Primary Care Trust. The Fife and Forth Valley Research Ethics Committee has examined this proposal and has raised no objections from the point of view of medical ethics.

Why have I been asked to take part?

You have been invited to take part as you have been given a diagnosis of breast cancer in the past year and you may feel this group could be of benefit to you. It is hoped to have small groups of between 6 – 8 women who have been diagnosed with breast cancer.

Do I have to take part?

It is your decision whether you decide to take part or not. Participation is voluntary and you may refuse to take part. If you feel this research could be of benefit to you, could you please fill out the reply slip enclosed and return it to the address shown. You will then be asked to sign a consent form which indicates that you have read and

understood this information and you will be consenting to completing questionnaires and to the data being used for research purposes.

If you do decide to take part you are still free to withdraw from the study at any time and do not have to give a reason for this. If you decide to not take part or withdraw, this will not affect your access to any services in the future.

What will I be asked to do?

If you decide to take part in this study, you will be randomly allocated to either the MBSR group or a waiting list control. If you are allocated to the group, you will be offered to start the group as soon as is convenient for you. The group will meet for 1.5 hours each week for 6 consecutive weeks either at Maggie's Centre, Kirkcaldy, or the Breast Care Service, Dunfermline. Please indicate your preference of venue on the reply slip. Please note there will be no reimbursement of travel expenses. You will be asked to complete 4 short questionnaires before starting the group, immediately after the group and 2/3 months after. If you are allocated to the waiting list, you will be offered to attend the group once the study has been completed providing that it is found to be beneficial. However, you will be asked to complete the questionnaires while you remain on the waiting list. A waiting list control allows us to ensure that any changes made during the study would not have been made due to time alone.

Are there any risks/benefits to taking part?

It is hoped this study will benefit you as it will give you time and space to help you cope with stress by introducing relaxation and meditation into your life. Research in MBSR has shown many improvements in symptoms such as anxiety, depression, pain and sleep problems.

You do not have to share any information you do not wish to. There should be no risks associated with taking part. However, you may stop the group at any time should you wish to. If at any time you wish to make a complaint about any aspect of the research, you can do so by following the normal complaints procedure through Fife Primary Care Trust, Cameron House, Leven.

Confidentiality

All information collected during this study will be kept strictly confidential. It will be stored securely on NHS property for five years after the study has been completed and the only people to have access to it will be myself and research supervisors. Any identifying information will be removed so that it is anonymous.

Results of the research study

The findings of this study may be shared with other professionals to increase our understanding and contribute to previous Mindfulness-Based research in an oncology setting. However, names will not be used and nobody will be identified in any publication from this study. Your opinions and experiences may also help further develop the services that breast cancer patients receive in Fife in the future.

If you require more information or have a specific question about the research I would be happy for you to contact me on 01334 696336 or contact your breast care nurse on 01383 627091.

Thank you for taking the time to read this information.

Lesley Meiklejon
Trainee Clinical Psychologist

Reply slip

I am interested in taking part in this group and would like to find out more ☐

I would prefer to attend the Maggie's Centre, Kirkcaldy on Tuesday from 2.30 – 4 p.m. ☐

I would prefer to attend the Breast Care Service, Dunfermline on Monday from 6 – 7.30 p.m. ☐

Name _____

Address

Telephone Number Home _____

Mobile _____

Please return this in the stamped addressed envelope to the Breast Care Service or contact me on 01334 696336. If you are unable to reach me please leave your contact details with the secretary or on the answering machine and I will get back to you as soon as possible.

Appendix 11
Covering Letter



Breast Service
Queen Margaret Hospital
Whitefield Road
Dunfermline
Fife KY12 0BR

Tel phone 01383 627091

Date

Dear

We are writing to invite you to participate in a research project being organised by Lesley Meiklejon. The project is about a stress reduction programme which may be of benefit to those who have had a diagnosis of breast cancer. The programme aims to reduce stress, promote relaxation and lessen physical discomfort and emotional distress.

The project has approval of the local research ethics committee and also Mr Neades and Mr Young. We have enclosed some information for you to read which also explains what will be involved. If you do not wish to take part you need do nothing more and you will not be contacted about this project again.

If you would like to discuss this further without obligation or feel you might like to participate, please contact your breast care nurse specialist at the number above or if you wish contact the researcher, Lesley directly.

Thank you for taking the time to read this.

Yours sincerely

Appendix 12
Consent Form

CONSENT FORM

Title of Project: The effect of a mindfulness based stress reduction programme on adjustment to breast cancer.

Name of Researcher: Lesley Meiklejon

Please initial box

- | | | |
|----|--|--------------------------|
| 1. | I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to ask questions and have had these answered to my satisfaction. | <input type="checkbox"/> |
| 2. | I understand that my taking part in this study is voluntary and that I am free to withdraw at any time without giving any reason and without the service I receive being affected. | <input type="checkbox"/> |
| 3. | I agree to my GP being informed of my participation in the study. | <input type="checkbox"/> |
| 4. | I agree to take part in the above study. | <input type="checkbox"/> |

_____	_____	_____
Name of Participant	Signature	Date
_____	_____	_____
Name of Researcher	Signature	Date

1 x copy for Participant, 1 x copy for Researcher

Appendix 13

Letter of Invitation to MBSR Group

Dear

Thank you for opting into this study. I have sent you two consent forms and five questionnaires.

- Could you please read and sign the consent forms and keep one copy for yourself and return one copy to me.
- Could you also complete the questionnaires enclosed and send them to me, along with the consent form, in the envelope provided. Alternatively, you could bring them to the first session. Please note that most of the questionnaires are double sided.

Upon opting into this study you have been randomly allocated to the Mindfulness Based Stress Reduction group in Dunfermline. This will be held at the Breast Care Service which is situated in area 3 of the Outpatient's Department, Queen Margaret Hospital, Dunfermline.

The group will begin on Monday 3rd September and finish on Monday 22nd October. The group runs for 6 sessions on Monday evenings between 6 – 7.30 p.m.

The dates for the group are as follows:

Monday 3rd September

Monday 10th September

Monday 17th September

Monday 24th September

Monday 8th October

Monday 22nd October

Please wear comfortable, loose clothing. If you have any questions please do not hesitate to contact me on 01334 696336. I hope you are able to attend and look forward to meeting you.

Yours sincerely

Lesley Meiklejon

Appendix 14

Control Group Letter

Dear

Re: Mindfulness Based Stress Reduction Programme

Thank you for completing and sending back the questionnaires. Upon opting into this study you have been randomly allocated to the waiting list control. A waiting list control allows us to ensure that any changes in your stress levels during the study period are due to the treatment and would not have been made due to time alone. This means that you will be sent the same 4 questionnaires to complete in approximately one month. Once I have received these questionnaires you will be invited to attend the group which is due to start at the beginning of March.

Thank you for your continued interest in this study. It is hoped your opinions and experiences will help further develop Mindfulness-Based research in an oncology setting and particularly the services that breast cancer patients receive in Fife. In the meantime, if you have any concerns please do not hesitate to contact your breast care nurse or myself on 01334 696336.

Yours sincerely

Lesley Meiklejon

Appendix 15

Control Group Post-Intervention Letter

Dear

Re: Mindfulness Based Stress Reduction Programme

As you may recall, upon opting into this study you were randomly allocated to the waiting list control. Thank you for your patience while remaining on the waiting list. Before being invited to attend the Mindfulness Based Stress Reduction group, could you please complete the same 4 questionnaires and send them to me in the envelope provided. Please note that the questionnaires are double sided.

Thank you for your continued co-operation in this study. Please do not hesitate to contact me should you require help completing the questionnaires. Once I receive the completed questionnaires you will be invited to attend the group which is due to start at the beginning of March and run till mid April. In the meantime, if you have any concerns please do not hesitate to contact your breast care nurse or myself on 01334 696336.

Yours sincerely

Lesley Meiklejon

Appendix 16
MBSR Manual

The Mindfulness Based Stress Reduction Programme



NHS Fife

Programme Description

- Week 1:** Introduction: Booklet distribution, introductions, group ground rules, CD distribution, introduction of mindfulness, diaphragmatic breathing, body scan.
- Week 2:** Mindfulness: Discussion of home practice, Mindfulness exercise and discussion, mindfulness attitudes, yoga postures, body scan.
- Week 3:** Mind-Body Connection: Discussion of home practice, discussion of the mind-body connection, yoga postures, sitting meditation.
- Week 4:** Balance in the Autonomic Nervous System: Discussion of home practice, discussion of balance and the autonomic nervous system, breathing exercises, walking and sitting meditation.
- Week 5:** Attitudes and Coping: Discussion of home practice, thoughts, beliefs and attitudes, and how they affect our experience of stress, loving kindness meditation.
- Week 6:** Imagery and Summary: Discussion of home practice, imagery exercise, the uses of imagery, lake meditation, discussion of personal experience over the course, plans for support and follow-up.

Readings – Week 1

Introduction



*Until one is committed there is always hesitancy,
The chance to draw back, always ineffectiveness.
Concerning all acts of initiative and creation,
There is one elementary truth,
The ignorance of which kills countless ideas and splendid plans:
The moment one definitely commits oneself, then providence moves too.
All sorts of things occur to help that would never otherwise have occurred.
A whole stream of events issues from the decision,
Raising to one's favour all manner of unforeseen accidents and meetings
And material assistance which no one could have dreamed
Would come their way
Whatever you can do, or dream you can, begin it.
Boldness has genius, power and magic in it.*

- Goethe -

Group Ground Rules

To assure that the group is a safe and respectful place for all members to be, we ask that you follow these ground rules:

- Attendance:** Please be present and on time for meetings. If you are unable to do so, please contact me on 01334 696336.
- Commitment:** You are expected to complete the six week programme. If you must discontinue, please contact the facilitators. You are also expected to commit to daily practice at home.
- Confidentiality:** While you may share your experience in the group with others, please do not disclose information about other group members. First names will be used in the group setting.
- Self-responsibility:** We encourage you to participate as fully as possible in a way which feels right to you. Your right to not disclose on any topic of discussion will be respected in the group.
- Safety:** We ask that you be aware of your own physical limitations throughout the program. Please modify all instructions to suit your present capacity. Consult your G.P. to identify any limitations on participation if you are uncertain.
- What to wear:** Wear comfortable clothing suitable for doing the gentle stretching exercises. If you wish, you can bring a blanket for warmth or a pillow for support during the meditations.

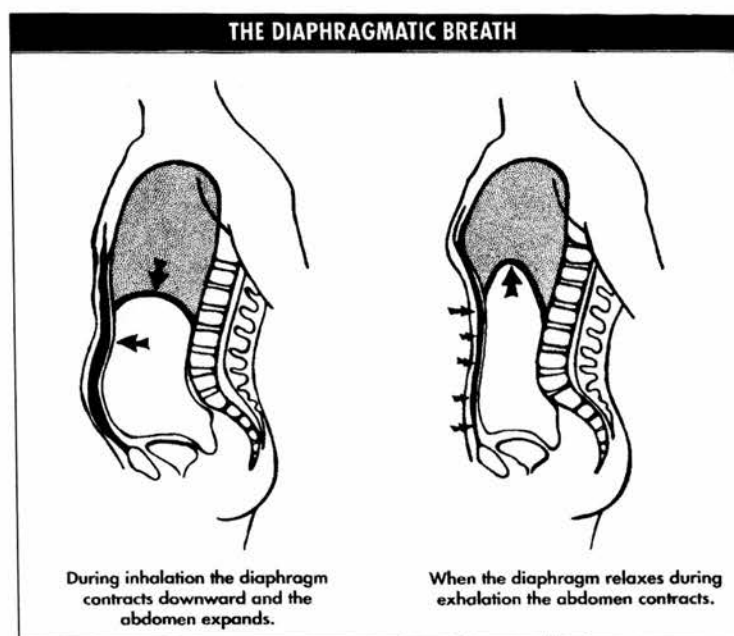
What is Mindfulness?

Mindfulness refers to the concept of developing awareness in the present moment and of all that is happening, in the moment – without judging or evaluating your experience. Often, we spend much of our lives either reliving the past or planning for the future and tend to miss the only time that we actually do our living – the present. Mindfulness meditation uses this concept of moment-to-moment awareness to help us to simply BE where we are rather than in the past or future. The breath is used as an anchor for attention and allows focus to be centred on the ever-present rhythm of the breath to promote awareness, calmness and clarity.



Diaphragmatic Breathing

- Most of the time, we are unaware of the quality of the breath and how it interacts with our thoughts and emotions.
- Diaphragmatic breathing is a way to deepen and lengthen the breath, which results in deep relaxation and tension reduction.
- It is the first step in the practice of yoga and meditation.



The breath is always with us and is the thread which connects every moment of our lives. It can bring us in touch with our bodies and our emotions. Mindfulness of breathing can be practised in a number of ways and situations, from an informal checking in with the breath at occasional moments throughout the day to the formal practice of meditation on the breath.

When we are practicing mindful breathing it can be helpful sometimes to allow our facial muscles to relax into a half smile (this is a smile of composed contentment and not a smirk or beam of communication to others). This subtle half smile can also be useful when we are facing something challenging or distressing for us. It can communicate to us a sense of positivity and coping. Try practicing mindful breathing with a half smile when you first wake up in the morning, when you have a free moment, when you are feeling irritated, when you are stuck in a traffic jam, when you are late or when you are thinking of someone who has upset you.

Homework Log:

DATES	TOTAL MINUTES IN MEDITATION	COMMENTS
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
TOTAL WEEKLY MINUTES:		

*I went to the woods because I wished to live deliberately,
To front only the essential facts of life.
And see if I could not learn
What it had to teach,
And not, when I came to die,
Discover that I had not lived*

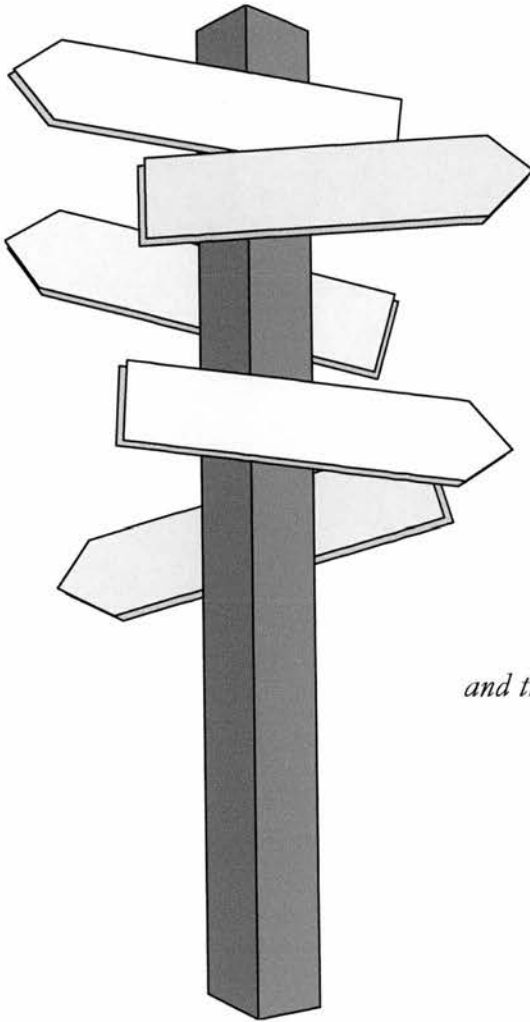
- Thoreau -

Readings – Week 2

Mindfulness

The Journey

*One day you finally knew
What you had to do, and began,
Though the voices around you*



*Kept shouting
Their bad advice –
Though the whole house
Began to tremble
And you felt the old tug
At your ankles.
“Mend my life!”
Each voice cried
But you didn’t stop.
You knew what you had to do,
Though the wind pried
With its stiff fingers
At the very foundations,
Though their melancholy
Was terrible.*

*it was already late
enough, and a wild night,
and the road full of fallen branches and stones.*

*But little by little,
As you left their voices behind,
The stars began to burn
Through the sheets of clouds,
And there was a new voice
Which you slowly
Recognized as your own,
That kept you company*

*As you strode deeper and deeper
Into the world,
Determined to do
The only thing you could do –
Determined to save
The only life you could save.*

- Mary Oliver -

Mindfulness Meditation: Attitudes

Several attitudes are the foundations of mindfulness meditation practice:

1. **Non-Judging:** Mindfulness is cultivated by assuming a stance of impartial witness to our own experience. This requires that we become aware of the constant stream of evaluative and judging thoughts that we have – then try to step back. With a non-judging mind, things become neither “good” nor “bad” – but simply present or absent.
2. **Patience:** Mindfulness is a practice of not trying to get anywhere and just letting things unfold in their own time. We tend to be impatient with ourselves, expecting we “should” be able to calm the mind, stop the thoughts, or get over whatever is upsetting us. These things have their own schedule; the mind has a “mind of its own” and patience allows us to simply observe the unfolding of the mind and body over time.
3. **Beginner’s Mind:** In order to be able to see the richness of the present moment, it helps to cultivate a mind that is willing to see everything as if for the very first time. We tend to become jaded and think we’ve seen or done it all. With beginner’s mind, the joys of the world as it unfolds around us become new again, as if we are all children – freed from our old expectations based on past experiences.

4. **Trust:** You are your own best guide. This is true. It is far better to trust your own feelings and intuition than to get caught up in the authority of "experts". If at anytime something doesn't feel right to you, pay attention, examine your feelings, and trust in your intuition and your own basic wisdom and goodness.
5. **Non-Striving:** Meditation is different from all other human activity: we do it not with a goal or destination in mind, but rather with a mind towards simply being – not doing. There is no goal other than for you to be conscious of yourself as you are.
6. **Acceptance:** Acceptance involves seeing things as they actually are in the present. We may not like it, but if that's the way things are, so they are. Sooner or later we all must come to terms with things as they are and accept them. Acceptance allows us to cease struggling to change things which are beyond our ability to control and is the first step in any genuine process of change. Only with acceptance can the mind become free.
7. **Letting Go:** Letting go, also known as "non-attachment", is fundamental to the mindfulness meditation practice. In our minds, there are often things we want to hold on to, whether they are good memories or bad feelings. Our minds tend to grasp some thoughts and push others away. With letting go, we put aside the tendency to elevate some parts of our experience and reject others – simply letting our experience be what it is, accepting things as they are without judging.

From (Kabat-Zinn, J., 1990)

Benefits of Mindfulness Meditation

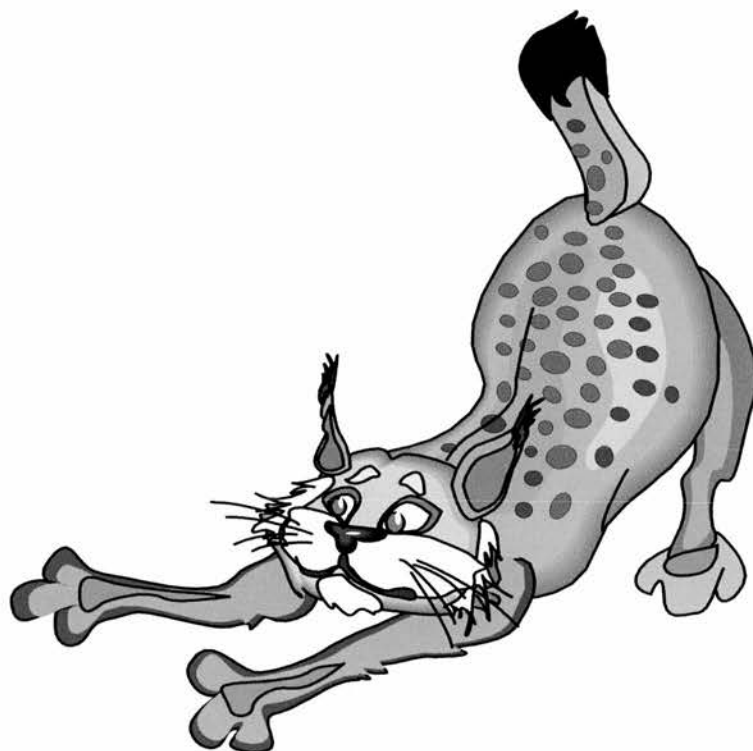
- Calms the body, mind and spirit.
- Trains us to let go of past regrets and future worries and to be able to live more fully in the present moment.
- Reminds us of our fundamental connection to the world outside of ourselves.
- Helps us find peacefulness and clarity within a hectic world.



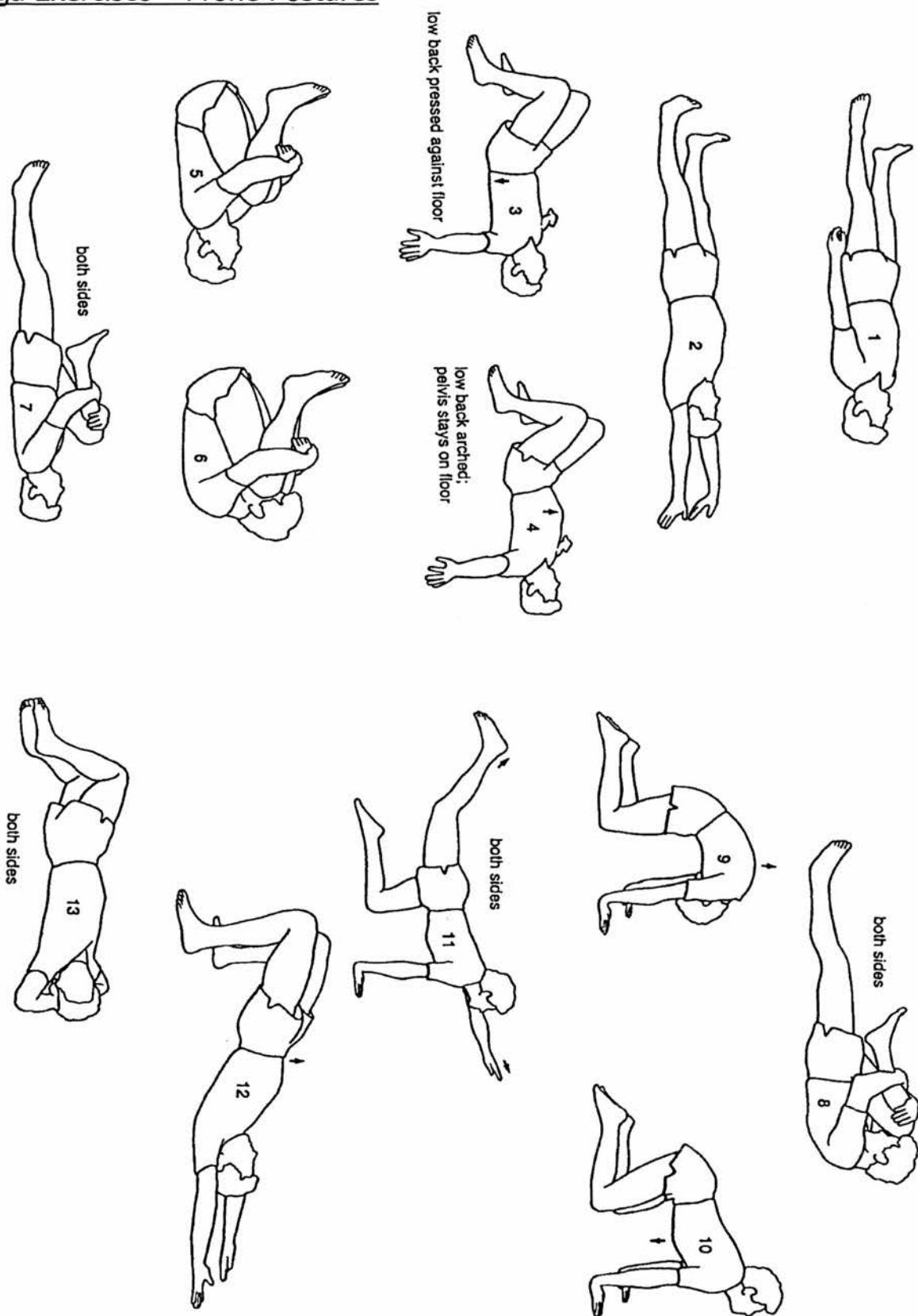
- Decreases levels of stress, anxiety and mood disturbance.
- Decreases pain levels and the experience of pain.
- Balances the autonomic nervous system through diaphragmatic breathing.
- Slows the heart rate, decreases blood pressure.
- Strengthens the body's immune system.
- Decreases levels of stress hormones.
- ➔ These benefits of meditation continue for some time after formal practice.

Yoga Exercises

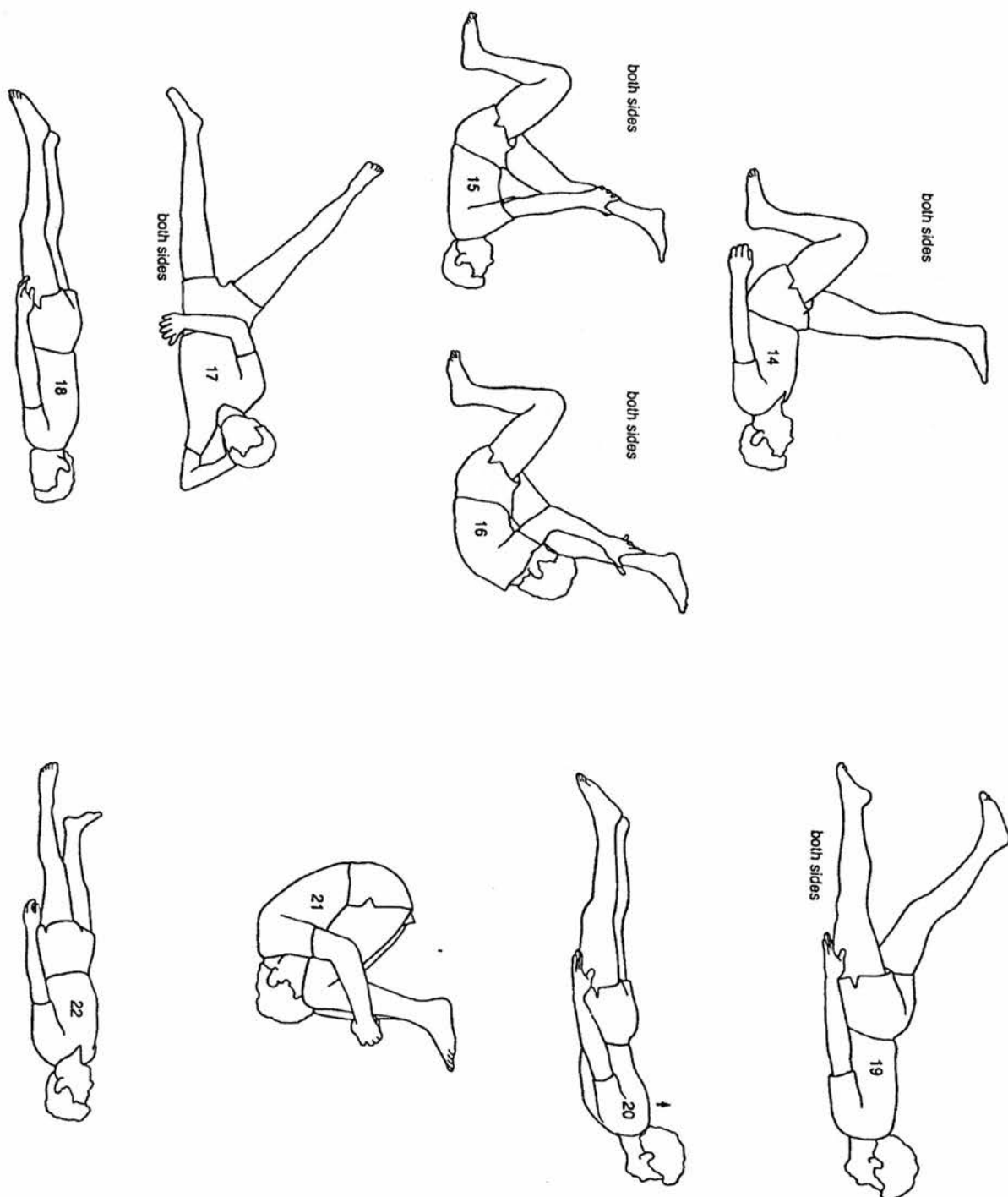
- "Yoga" means union – union between the mind, body and spirit; between the individual and the greater whole.
- Yoga IS meditation. Focus on being mindful during the yoga practice.
- Gentle stretching strengthens the nervous, muscular and glandular systems and improves flexibility both in mind and body.
- Take responsibility for reading your own body's signals. Err on the side of gentleness and caution. Listen to your body mindfully and don't push beyond your limits.
- Have patience. For people with health problems, it is especially important not to push beyond your own limits.
- Your body will be different each day, on each side of the body and change from moment to moment during the practice. Be aware of these differences.
- With continued practice, boundaries and limits recede over time.



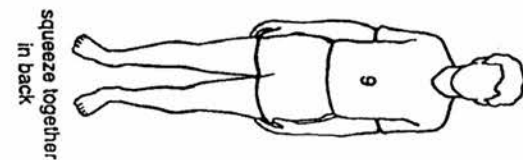
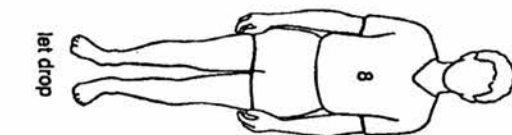
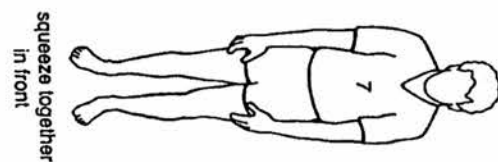
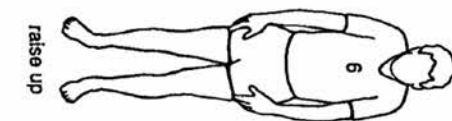
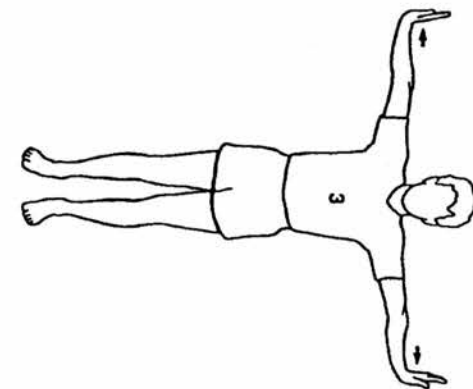
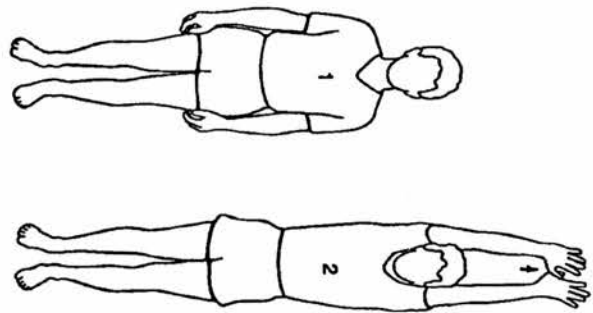
Yoga Exercises – Prone Postures



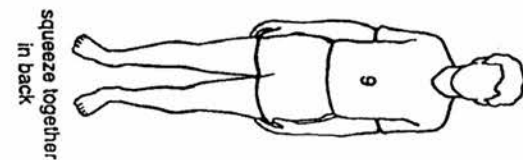
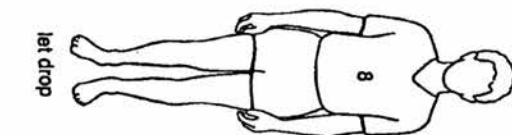
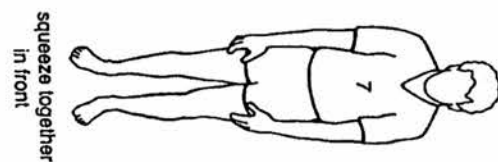
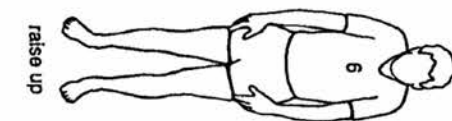
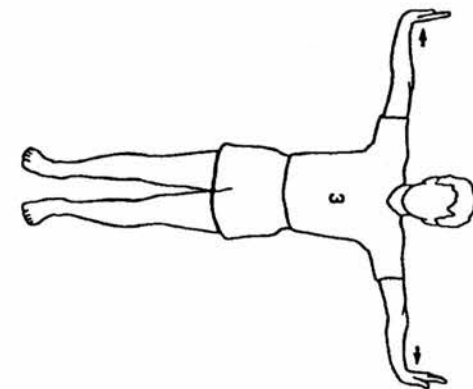
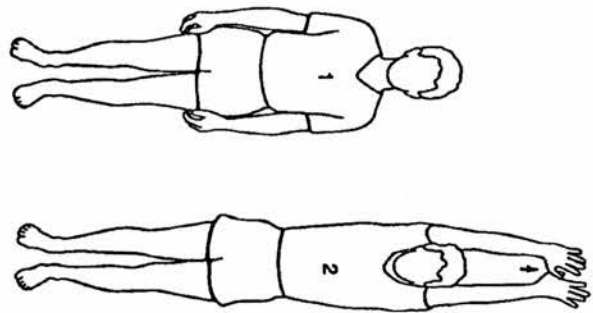
Yoga Exercises – Prone Postures (Cont.)



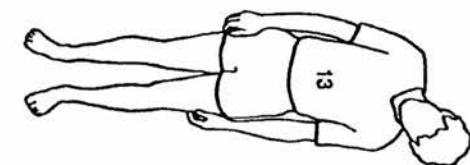
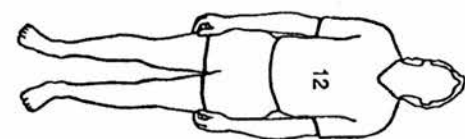
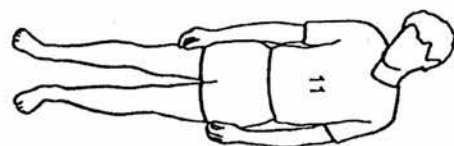
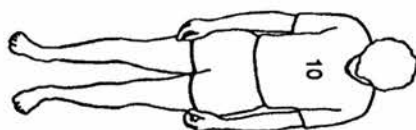
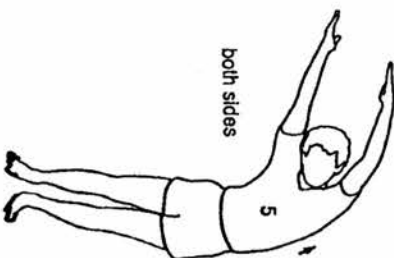
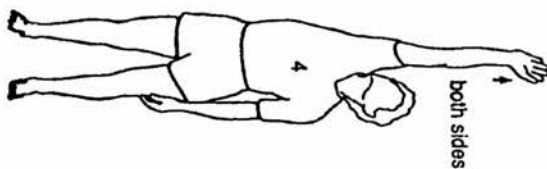
Yoga Exercises – Standing Postures



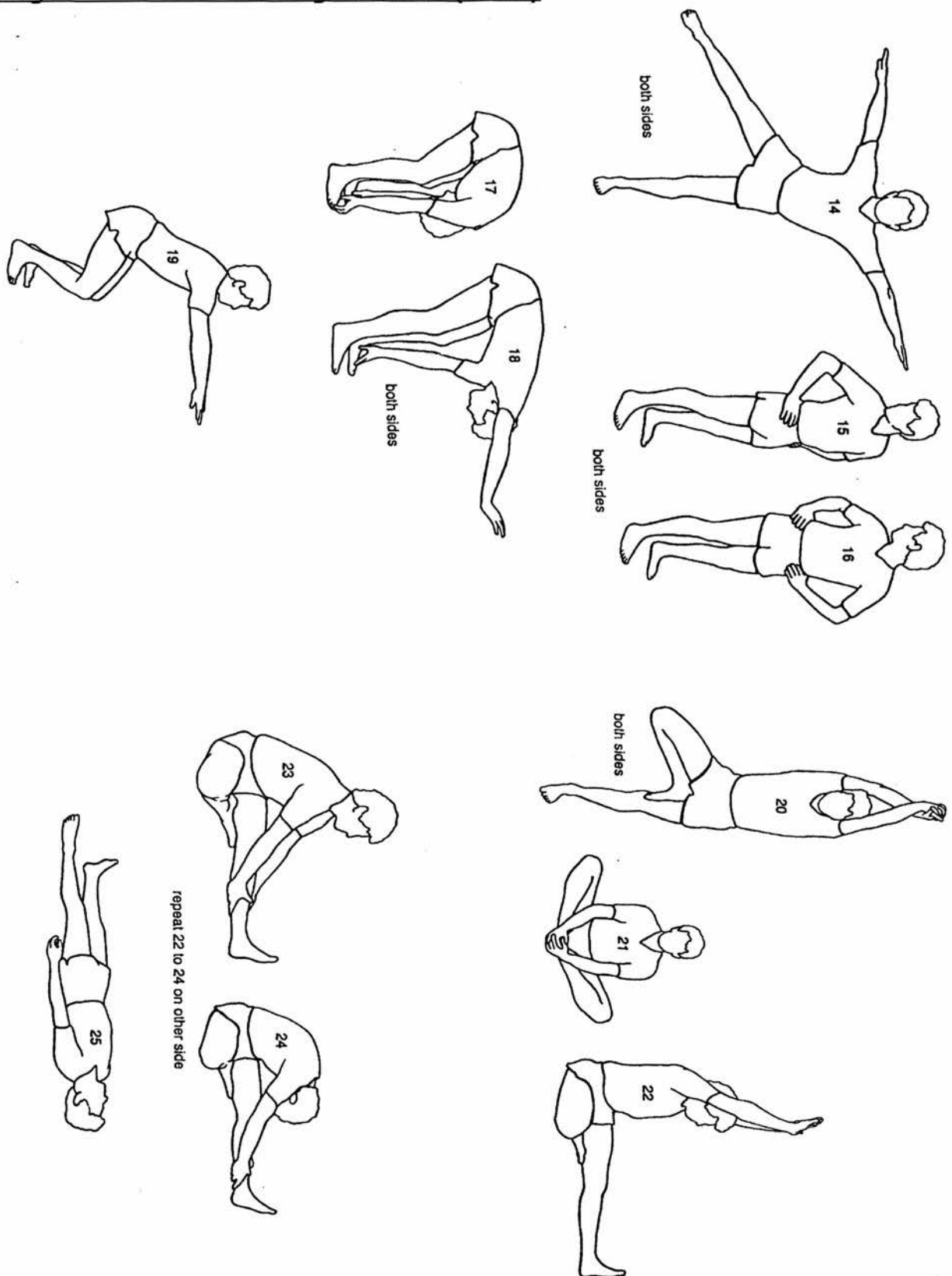
shoulder rolls: do in forward, then backward directions



neck rolls: do in one direction, then the other



Yoga Exercises – Standing Postures (Cont.)



Homework Log:

DATES	TOTAL MINUTES IN MEDITATION	COMMENTS
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To front only the essential facts of life.
And see if I could not learn
What it had to teach,
And not, when I came to die,
Discover that I had not lived*

- Thoreau -

Readings – Week 3

Mind-Body Connection

Balance in the Autonomic Nervous System

I said to the wanting-creature inside me:

What is this river you want to cross?

There are no travelers on the river-road, and no road.

Do you see anyone moving about on that bank, or resting?

There is no river at all, and no boat, and no boatman.

There is no towrope either, and no one to pull it.

There is no ground, no sky, no time to bank, no ford!

And there is no body, and no mind!

Do you believe there is some place that will make the soul less thirsty?

In that great absence you will find nothing.

Be strong then, and enter into your own body;

There you have a solid place for your feet.

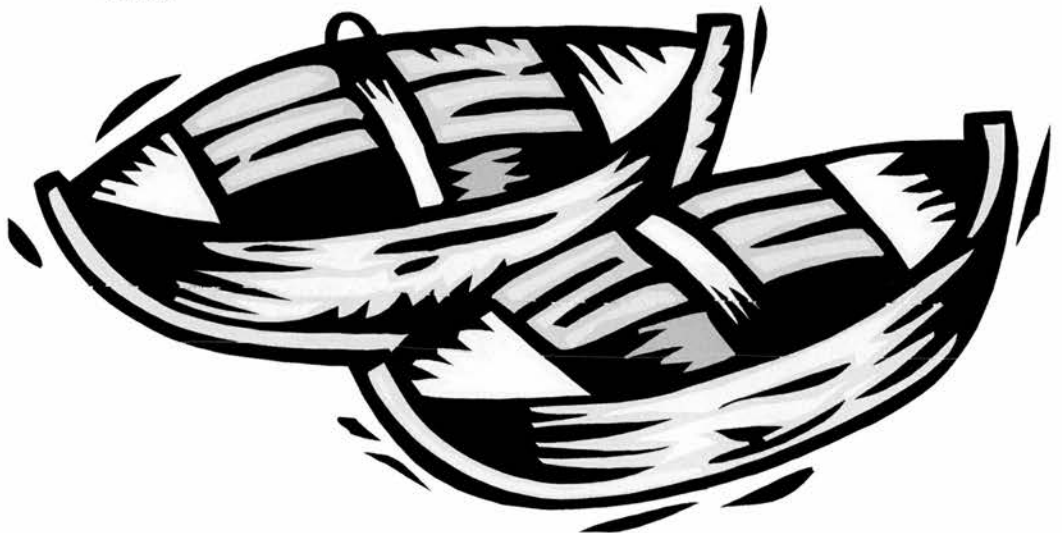
Think about it carefully!

Don't go off somewhere else!

Just throw away all thoughts of imaginary things,

And stand firm in that which you are.

- Kabir -



Symptoms of Stress – Self Assessment

Check off any of the following symptoms of stress that you have experienced in the last week.

Physical Symptoms

- | | | |
|--|--|--|
| <input type="checkbox"/> Headaches | <input type="checkbox"/> Sleep difficulties | <input type="checkbox"/> Racing heart |
| <input type="checkbox"/> Indigestion | <input type="checkbox"/> Dizziness | <input type="checkbox"/> Restlessness |
| <input type="checkbox"/> Stomach aches | <input type="checkbox"/> Back pain | <input type="checkbox"/> Tiredness |
| <input type="checkbox"/> Sweaty palms | <input type="checkbox"/> Tight neck, shoulders | <input type="checkbox"/> Ringing in ears |

Behavioural Symptoms

- | | |
|---|---|
| <input type="checkbox"/> Excess smoking | <input type="checkbox"/> Grinding teeth at night |
| <input type="checkbox"/> Bossiness | <input type="checkbox"/> Overuse of alcohol |
| <input type="checkbox"/> Compulsive gum chewing | <input type="checkbox"/> Compulsive eating |
| <input type="checkbox"/> Critical attitude | <input type="checkbox"/> Inability to get things done |

Emotional Symptoms

- | | |
|---|---|
| <input type="checkbox"/> Crying | <input type="checkbox"/> Overwhelming feeling of pressure |
| <input type="checkbox"/> Nervousness, anxiety | <input type="checkbox"/> Anger |
| <input type="checkbox"/> Boredom, no meaning to things | <input type="checkbox"/> Loneliness |
| <input type="checkbox"/> Irritable – ready to explode | <input type="checkbox"/> Unhappiness for no reason |
| <input type="checkbox"/> Feeling powerless to change things | <input type="checkbox"/> Easily upset |

Cognitive Symptoms

- | | |
|---|---|
| <input type="checkbox"/> Trouble thinking clearly | <input type="checkbox"/> Indecisiveness |
| <input type="checkbox"/> Forgetfulness | <input type="checkbox"/> Thoughts of running away |
| <input type="checkbox"/> Lack of creativity | <input type="checkbox"/> Constant worry |
| <input type="checkbox"/> Memory loss | <input type="checkbox"/> Loss of sense of humour |

Spiritual Symptoms

- | | | |
|--|--|---|
| <input type="checkbox"/> Emptiness | <input type="checkbox"/> Martyrdom | <input type="checkbox"/> Cynicism |
| <input type="checkbox"/> Loss of meaning | <input type="checkbox"/> Looking for magic | <input type="checkbox"/> Apathy |
| <input type="checkbox"/> Doubt | <input type="checkbox"/> Loss of direction | <input type="checkbox"/> Need to "prove" self |
| <input type="checkbox"/> Unforgiving | | |

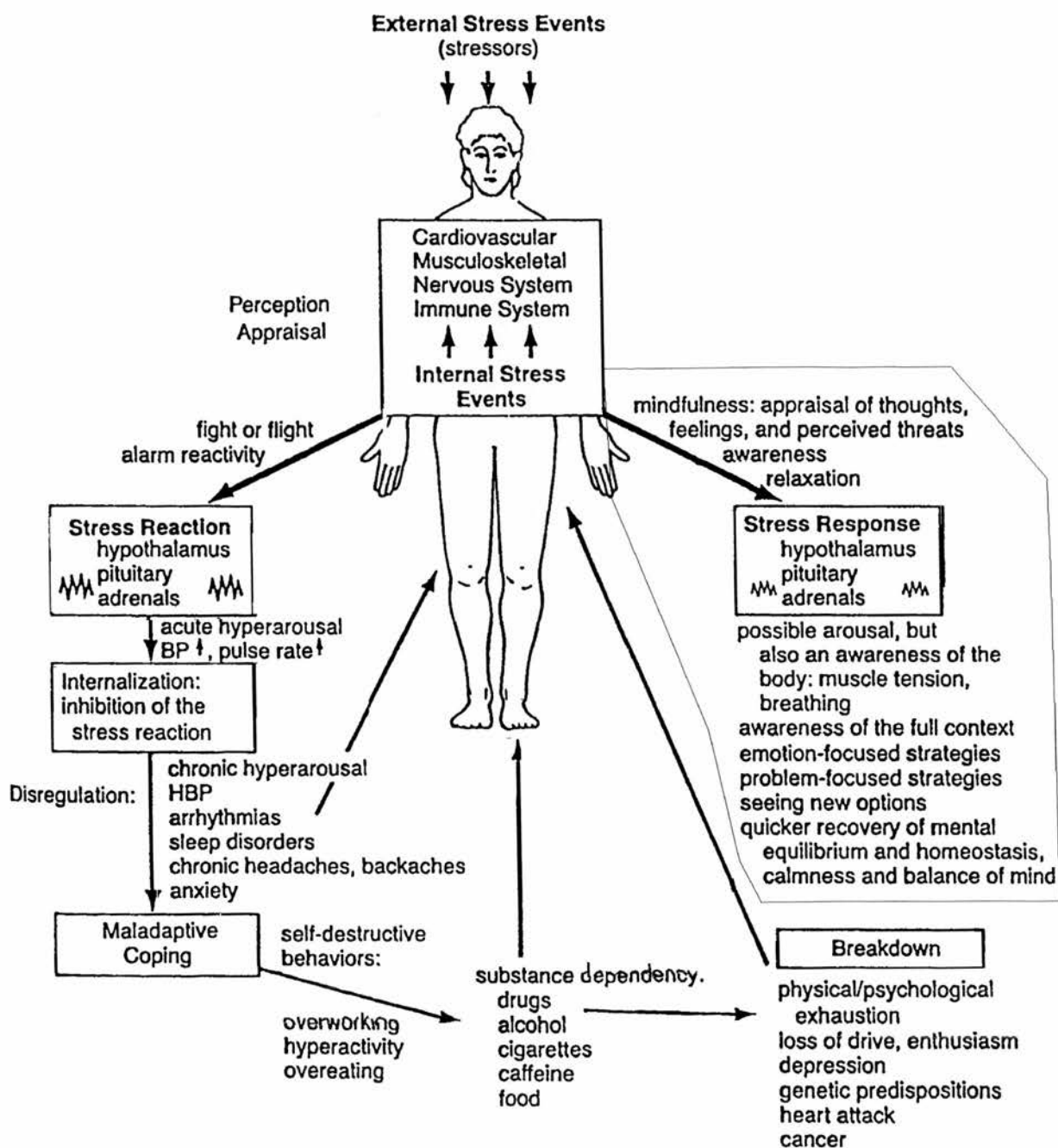
Relational Symptoms

- | | | |
|--------------------------------------|--|--|
| <input type="checkbox"/> Isolation | <input type="checkbox"/> Hiding | <input type="checkbox"/> Lack of intimacy |
| <input type="checkbox"/> Intolerance | <input type="checkbox"/> Clamming up | <input type="checkbox"/> Using people |
| <input type="checkbox"/> Resentment | <input type="checkbox"/> Lowered sex drive | <input type="checkbox"/> Fewer contacts with friends |
| <input type="checkbox"/> Loneliness | <input type="checkbox"/> Nagging | |
| <input type="checkbox"/> Lashing out | <input type="checkbox"/> Distrust | |

A high number of stress symptoms can be an indication that you are experiencing chronic activation of the stress response, which can be damaging and maladaptive until you learn how to respond to the stresses of life in a healthy way.

The Stress Response

COPING WITH STRESS: RESPONDING VS. REACTING

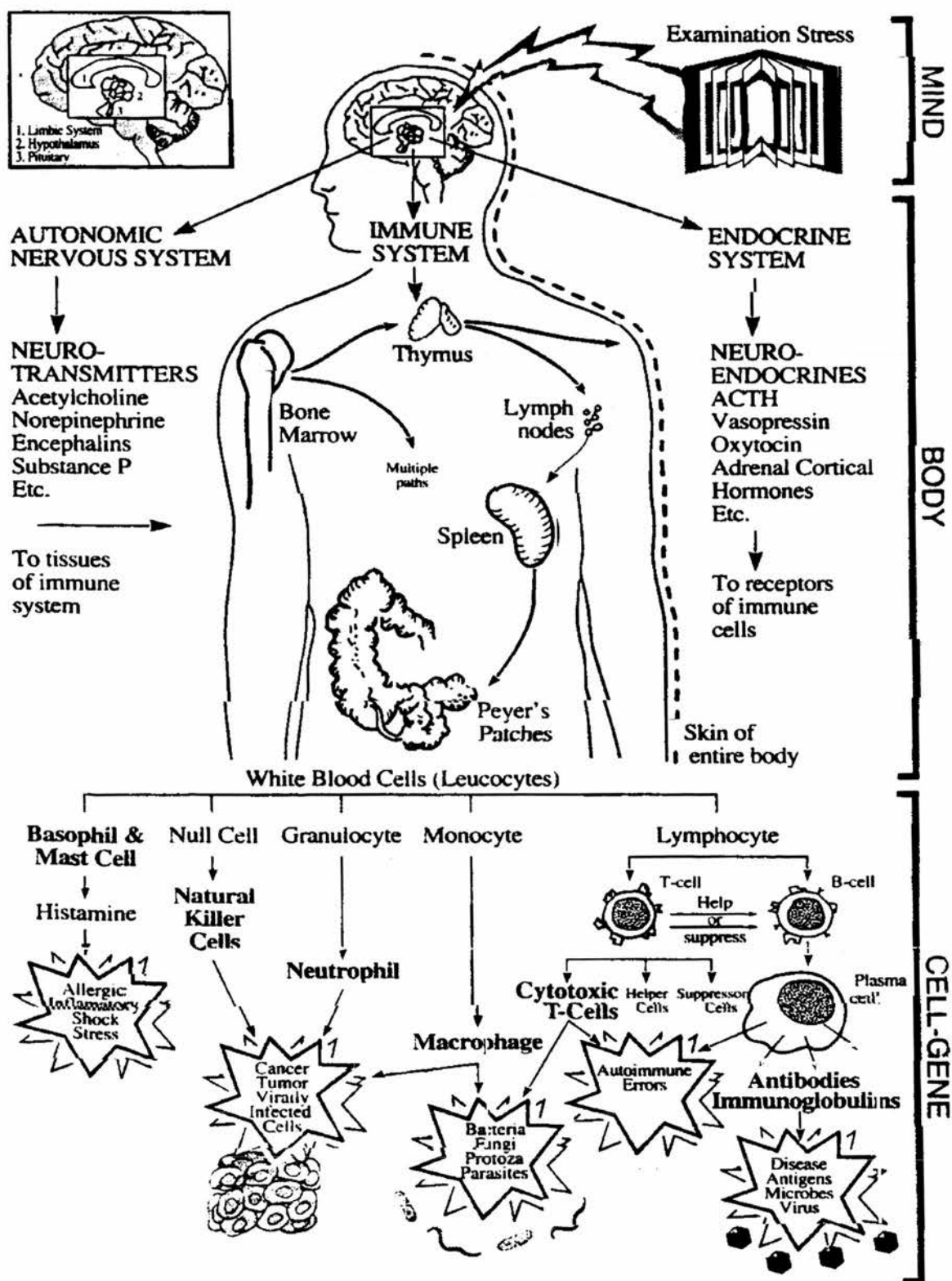


From (Kabat-Zinn, J., 1990)

Psychoneuroimmunology

- Psychoneuroimmunology looks at the links between the central nervous system, the immune system, and the endocrine system (which work in an integrated fashion).
- Stress triggers off all three of these systems.
- In the short term you get:
 - Arousal in the autonomic arm of the central nervous system
 - Secretion of adrenalin and noradrenalin
 - Fight or flight reaction:
 - ⇒ Increased heart rate
 - ⇒ Increased blood pressure
 - ⇒ Sweaty hands
 - ⇒ Shakiness
 - ⇒ Shortness of breath
- In the longer term you get:
 - Activation of the endocrine (hormonal) system through the hypothalamus in the brain.
 - Secretion of the hormone cortisol from the adrenal gland.
 - ⇒ Suppression of the immune system (because cortisol travels through the blood stream and communicates with cells of the immune system, effectively shutting many of them down).
 - ⇒ Inhibition of digestive and sexual functioning, sleep disruption, impaired memory & learning, and depression.
- The communication between these systems is **TWO WAY**:
 - While hormones travelling through the blood stream and electrical messages travelling through the nerves can tell the immune system to slow down...
 - The immune system is also activated by dealing with an intruder (virus, bacteria). It communicates with the nervous and endocrine systems and results in symptoms such as drowsiness and lack of energy and motivation through the nervous and endocrine systems.

Psychoneuroimmunology (Cont.)



From (Rossi, E. L., 1986)

Sitting Mindfulness Meditation Practice

- 1.** Find a comfortable position on a cushion or a chair in which your torso is upright and your back is straight, allowing your breath to flow easily into the belly.
- 2.** Focus your attention on the movement of your breath as it flows deep into the lungs and expands the belly (abdominal breathing).
- 3.** Continuing to attend to the breath as you exhale and the belly drops. Allow the muscles in your body to relax.
- 4.** Maintain attention to the breath as you inhale and exhale, noting the sensation of the breath as it moves through different points in the body.
- 5.** When you become distracted by thought, simply note "thinking", and purposefully let go of the thought – returning attention to the breath. This will have to be gently repeated, time and again.
- 6.** Continue!
- 7.** Meditating in one position for an extended period of time may lead to feelings of discomfort in the body. Should this happen simply keep the observing mind on that point of the body, noting the sensation. Continue to meditate and the feelings may cease or diminish. If you must, readjust your position. However, do so mindfully – first making a mental note of the intention – then moving purposefully.
- 8.** Resume.



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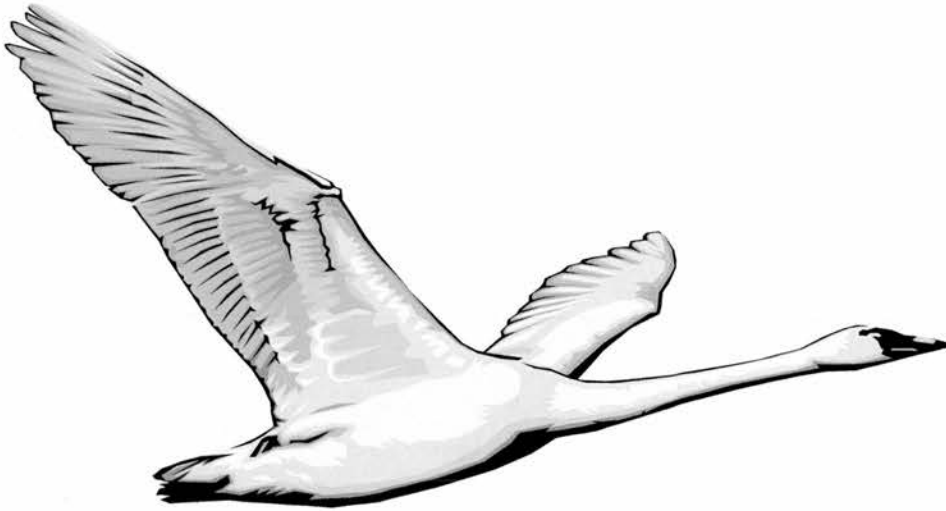
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What it had to teach,
And not, when I came to die,
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- Thoreau -

Readings – Week 4

Balance in the Autonomic Nervous System

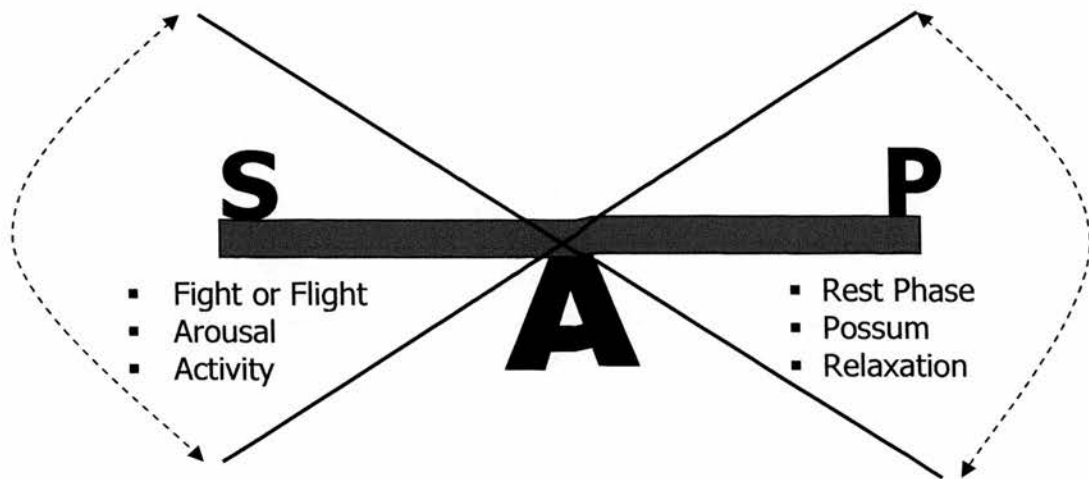


Wild Geese

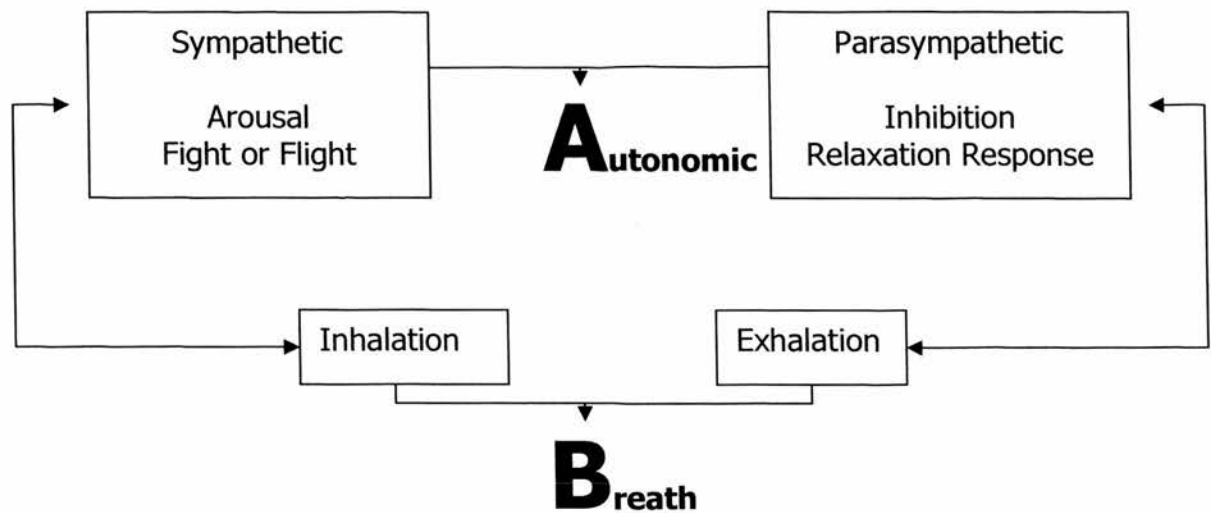
*You do not have to be good.
You do not have to walk on your knees
For a hundred miles through the desert, repenting.
You only have to let the soft animal of your body love what it loves.
Tell me about despair, yours, and I will tell you mine.
Meanwhile the world goes on.
Meanwhile the sun and the clear pebbles of the rain
Are moving across the landscapes,
Over the prairies and the deep trees,
The mountains and the rivers.
Meanwhile the wild geese, high in the clean blue air,
Are heading home again.
Whoever you are, no matter how lonely,
The world offers itself to your imagination,
Calls to you like the wild geese, harsh and exciting –
Over and over announcing your place
In the family of things.*

- Mary Oliver -

Balance in the Autonomic Nervous System



Breath and Autonomic Balance

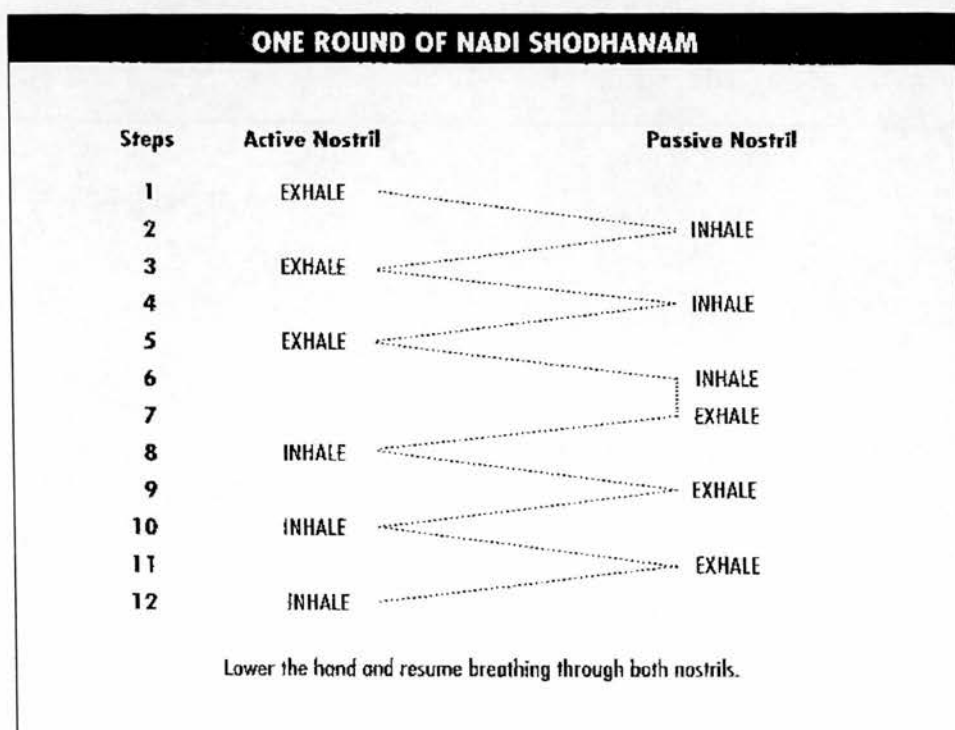


Alternate Nostril Breathing

- Although we may not be aware of it, at any given time, we are breathing through one nostril more than the other – that is, one nostril is **ACTIVE**, while the other is **PASSIVE**.
- The active (or dominant) nostril changes cyclically – about every 90-120 minutes
- When the right nostril is dominant, activity is warmed and intensified in the mind and body. Right nostril dominance is good for eating, conducting business, or hard physical work.
- When the left nostril is dominant it has a cooling and receptive influence. Left nostril dominance is good for listening, studying, resting and renewing the body and mind.
- By purposely regulating the flow of air through the nostrils, we can achieve a state of balance between the effects of the two nostrils. This practice is called: Nadi Shodhanam.

Steps:

1. Determine which nostril is more active at the present moment.
2. Bring the right hand to the nose. Place the thumb of the hand over the right nostril, and the ring and little fingers of the hand over the left nostril. Either tuck in the middle two fingers, or rest them on the forehead between the eyes.
3. Close the passive nostril at the end of an inhalation, and exhale through the active nostril.
4. Close the active nostril, and inhale through the passive nostril.
5. Follow the pattern dictated in the figure below, alternating back and forth until the third breath, when the rhythm is reversed for three more breaths.
6. Repeat for three rounds.



From: Yoga International "Balancing Active and Receptive Energies". 1995. Honesdale, PA.

"Mini" Relaxation Exercises

- Mini relaxation exercises are focused breathing techniques which help reduce anxiety and tension immediately!
- You can do them with your eyes open or closed (but make sure that your eyes are open when you are driving!).
- You can do them any place, at any time, no one will know that you are doing them.

Ways to "do a mini"...

Switch over to diaphragmatic breathing. If you are having trouble, try breathing in through your nose and out through your mouth, or take a deep breath. You should feel your stomach rising about an inch as you breath in, and falling about an inch as you breath out. If this is still difficult for you, lie on your back or on your stomach – you will be more aware of your breathing pattern. Remember, it is impossible to breathe diaphragmatically if you are holding your stomach in! So... relax you stomach muscles.

Mini Version 1

Count very slowly to yourself from ten down to zero – one number for each breath. Thus, with the first diaphragmatic breath you say "ten" to yourself; with the next breath, you say "nine"; etc. If you start feeling light-headed or dizzy – slow down the counting. When you get to "zero", see how you are feeling. If you are feeling better, great! If not, try doing it again.

Mini Version 2

As you inhale, count very slowly up to four; as you exhale, count slowly back down to one. Thus, as you inhale, you say to yourself "one, two, three, four". As you exhale, you say to yourself "four, three, two, one". Do this several times.

Mini Version 3

After each inhalation, pause for a few seconds; after you exhale, pause again for a few seconds. Do this for several breaths.

Good times to "do a mini"...

When stuck in traffic ... when put on "hold" during an important phone call ... while waiting in your doctor's waiting room ... when someone says something which bothers you ... at all red lights ... when waiting for a phone call ... in the dentist's chair ... when you feel overwhelmed by what you need to accomplish in the near future ... while standing in line ... when in pain ...

THE ONLY TIME THAT MINIS DO NOT WORK IS WHEN YOU FORGET TO DO THEM!!! So go do a mini...

Sleep Exercise

This elegant little technique will put you to sleep and will help you sleep more peacefully.

It uses an effortless 2-to-1 breath (breathing out for twice the length of time you breathe in).

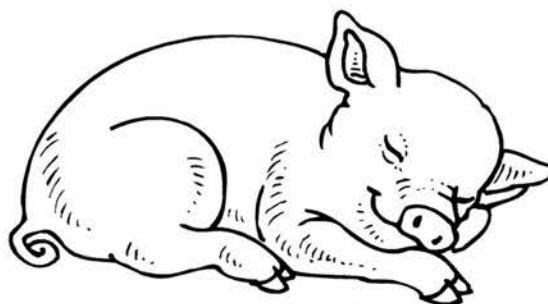
1. Get into bed and pay close attention to your breath.

There shouldn't be any pauses, jerks, or shakiness. Eliminate even the pause between the inhalation and exhalation.

2. Take:

- 8 breaths lying on your back
- 16 breaths lying on your left side
- 32 breaths lying on your right side

3. Repeat if you are still awake.



⇒ Very few people complete this exercise... Sweet dreams.

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Discover that I had not lived*

- Thoreau -

Readings – Week 5 Attitudes and Coping

The Guest-House

*This being human is a guesthouse
Every morning a new arrival.*

*A joy, a depression, a meanness,
Some momentary awareness comes
As an unexpected visitor.*

*Welcome and entertain them all!
Even if they're a crowd of sorrows,
Who violently sweep your house
Empty of its furniture.*

*Still, treat each guest honourably.
They may be clearing you out
For some new delight.*

*The dark thought, the shame, the malice,
Meet them at the door laughing,
And invite them in.*

*Be grateful for whoever comes,
Because each has been sent
As a guide from beyond.*



- Rumi -

Negative Thoughts

Sometimes the thoughts we have lead to feelings of self-blame and depression. Often this happens very quickly and automatically. Mindfulness allows us to cope with these thoughts by allowing us to slow down, take a step back, identify the thoughts, and look at the reasoning behind them. It can be helpful to identify and challenge assumptions and distortions in your thinking in order to obtain a more balanced understanding of a situation. This may allow new solutions, possibilities, or feelings to emerge.

Here are examples of some of the most common thinking errors:

Overgeneralizing: Forming a general rule from a single or limited number of examples and applying the rule broadly to many situations.

- Example: "I failed again – I'll never get anything right."

Jumping to Conclusions: Making a negative interpretation in the absence of definite facts to convincingly support it.

- Example: A friend doesn't return a phone call – "They don't want to talk to me." Doctor doesn't mention result of a test – "I must not be doing well."

Magnification (Catastrophizing) and Minimization: Exaggerating the importance or likelihood of something seen as negative or minimizing the importance or likelihood of something seen as positive.

- Example: "It's terrible and unbearable that my doctor recommends another treatment." or "My accomplishments don't amount to much."

Emotional Reasoning: Because you feel it or fear it, you believe it must be true.

- Example: The oncologist only spends a few moments with you during a clinic visit – "My oncologist doesn't like me." or "If I have negative thoughts my disease will return."

Mental Filters: Picking out a limited aspect of a situation or experience and allowing it to colour your perception of the whole event.

- Example: Waiter fails to bring you herbal tea you asked for – "It was a terrible evening".

All or Nothing Thinking: Seeing everything in black and white categories.

- Example: You lose your temper at your partner, child or friend or a supervisor asks you to redo some work – “I am a total failure!”

Personalization: Interpreting an event as being relevant to you or due to you when there are many other plausible causes or interpretations.

- Example: Person you know is walking in your direction and as they get closer they suddenly turn and walk in a different direction – “They were trying to avoid me.”

Labeling: An extreme form of generalization tends to cause the self or others to be seen as fixed and unchanging and ignores other aspects or possibilities of the thing or person.

- Example: “I’m a failure.” or “They are uncaring.”

Ultimatum words: Trying to motivate yourself (or others) with sweeping judgements – often combined with an unrealistic conclusion regarding the consequences of failing to do what one “must”, “should”, “never” ...

- Example: “I must get back to work or I know I’m going to lose my job and become destitute.”

When you identify these forms of thinking, **ask yourself:**

- How do I know that my assumption is true – what is the evidence?
- Are there any other possible explanations or ways of seeing it?
- Even if it is true – are the consequences necessarily as horrible as I feel they are?
- Is this really the most helpful interpretation or are there other possible explanations that would be more acceptable and allow further courses of action?
- Just because something may be true at one time or in one situation, does that mean it always will be true?

Knock the legs out from under assumptions that leave you dispirited. Look for exceptions to what you perceive to be the rule and act upon them rather than on self-limiting beliefs.

Challenging Negative Thoughts

SITUATION Describe event leading to the unpleasant emotion	EMOTIONS Describe the emotion aroused (angry, sad, anxious,...) Rate it 1 ☺ - 10 ☹	AUTOMATIC THOUGHTS What thoughts precede the negative emotion?	DISTORTIONS OF THOUGHT Identify the type of thinking error present in each automatic thought	HEALTHIER RESPONSE What is a more rational/healthier way to think about the situation?	OUTCOME How would you feel if you could substitute the healthy thought for the automatic one? Re-rate your emotion 1 ☺ - 10 ☹

Loving Kindness Meditation

Healing energy can be directed toward others and toward your relationships as well as toward your own body. This is a very effective way of healing yourself as the process of generating strong feelings of empathy, compassion and love toward others has a purifying effect on the mind. Use words that resonate with you, classic example is

May I/he/she be safe and protected,
May I/he/she be happy and peaceful,
May I/he/she be healthy and strong,
May I/he/she live with ease.

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Readings – Week 6

Imagery and Summary

Love After Love

*The time will come
When, with elation,
You will greet yourself arriving
At your own door, in your own mirror,
And each will smile at the other's welcome*



*And say, sit here. Eat
You will love again the stranger who was yourself.
Give wine. Give bread. Give back your heart
To itself, to the stranger who has loved you
All your life, whom you have ignored
For another, who knows you by heart.
Take down the love letters from the bookshelf,*

*The photographs, the desperate notes,
Peel your own image from the mirror.
Sit. Feast on your life.*

- Derek Walcott -

Imagery

What is it?

Imagery can be considered a process of directed or intentional daydreaming. It is a way of using the imagination to help mind and body heal and perform as desired. It is not (as often thought) strictly visual, but in fact becomes more powerful if it involves all the senses – including smell, taste, touch and hearing. Working with mental images in a relaxed state brings us closer to the unconscious mind – the reflexive, reactive parts of our being not mediated by our thoughts and ideas. It tends to bypass the edited and reconstructed versions of our lives and to work at an embodied level. Imagery can combat stress, fears, isolation, depression and anxiety.

Supportive Evidence from Research

- Imagery increased the number of circulating white blood cells and thymosin alpha 1 (a hormone used by helper T cells).
- Imagery increased the numbers of neutrophils (debris ingester cells in the immune system) in the bloodstream
- Children elevated their levels of immunoglobulin A using imagery
- Reduced pain
- Reduced effect of shock and blood loss after injury
- Reduced nausea during chemotherapy
- Lowered surgical stress and reduced recovery times
- Enhanced sports performance after adding imagery sessions to athletes training programs

Three Principle Assumptions Of Imagery Use

- I) Our bodies don't discriminate between sensory images in the mind and reality – that is, images elicit the same quality of body experience. For example, read a recipe and you may salivate as if you are hungry. Another example is physical sexual arousal obtained using fantasy. On the negative side we can also become physically conditioned to the sites and sounds associated with chemotherapy - so that the hospital hallway (or images and smells associated with it) can arouse nausea.
- 2) In a relaxed state we are capable of more rapid, intense healing, growth, learning and change. This altered state is a state of self-hypnosis -- a calm and energized alertness. This is a state often used by athletes to attain peak performance. Sometimes called being in the "zone" - it is a state in which we can intensely focus on the task at hand without distracting thoughts.
- 3) We feel better about ourselves when we have a sense of mastery over what is happening to us. Especially in the experience of serious illness, the sense of control over our lives may be lost -- leaving one with a sense of helplessness and leading to feelings of hopelessness. Using imagery may allow us a renewed sense of taking constructive action.

Summary

- Imagery is the introduction of images through the mind which the body experiences as real events.
- Evoking imagery in an altered state of deep relaxation makes it more psychologically/ physiologically powerful.
- Being able to do it when, how, and where we please returns a sense of personal control and mastery.

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To front only the essential facts of life.
And see if I could not learn
What it had to teach,
And not, when I came to die,
Discover that I had not lived*

- Thoreau -



The Summer Day

Who made the world?

Who made the swan, and the black bear?

Who made the grasshopper?

This grasshopper, I mean – the one who has flung herself out of the grass,

The one who is eating sugar out of my hand,

Who is moving her jaws back and forth instead of up and down –

Who is gazing around with her enormous and complicated eyes.

Now she lifts her pale forearms and thoroughly washes her face.

Now she snaps her wings open, and floats away.

I don't know exactly what a prayer is.

I do know how to pay attention, how to fall down

Into the grass, how to kneel down in the grass,

How to be idle and blessed, how to stroll through the fields,

Which is what I have been doing all day.

Tell me, what else should I have done?

Doesn't everything die at last, and too soon?

Tell me, what is it you plan to do

With your one wild and precious life?



- Mary Oliver -

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Useful Websites

www.umassmed.edu/cfm

www.mindandlife.org

www.bangor.ac.uk/imscar/mindfulness

Online Exercises

www.uvm.edu/health/mindfulness.html

www.wildmind.org

Local Information

www.edinburghbuddhistcentre.org.uk

<http://prana-shakti.com>

A range of classes such as meditation, yoga and pilates are on at the Synergy Yoga & Therapy Centre, 5 Crompton Rd, Southfield Industrial Estate, Glenrothes. Tel. 01592 631672. There are also yoga classes in leisure centres throughout Fife.

Appendix 17

**Table 3.5: Means on Study Variables at each
Measurement Point**

Table 3.5: Means on study variables at each measurement point

Variable	Baseline M (S.D.)		Post Intervention M (S.D.)		Follow Up M (S.D.)	
	MBSR (N=30)	Control (N=29)	MBSR (N=26)	Control (N=21)	MBSR (N=22)	Control (N=5)
MAAS	60.2 (17.3)	59.8 (11.9)	66.2 (14.9)	57.1 (8.6)	71.3 (13.3)	55.4 (6.2)
MAC						
-fighting spirit	50.4 (9.9)	52.9 (7.1)	51.4 (5.9)	52.4 (6.9)	53.1 (6.8)	52.6 (10.7)
-anxious preoccupation	22.2 (4.5)	23.1 (3.2)	21.8 (3.5)	23.6 (2.4)	21.3 (3.1)	23.4 (2.3)
helpless/hopeless	9.8 (4.2)	10.0 (3.7)	9.2 (3.4)	9.8 (2.8)	8.7 (2.8)	9.2 (4.6)
POMS	77.0 (45.7)	82.2 (39.1)	56.2 (25.6)	85.7 (36.7)	44.1 (30.2)	74.8 (35.9)
COPE						
-acceptance	12.9 (2.9)	12.8 (2.4)	12.7 (3.5)	12.8 (2.4)	12.4 (3.8)	13.4 (1.7)
-problem focused coping	21.3 (6.6)	20.7 (6.0)	21.9 (6.4)	20.1 (6.2)	22.7 (6.5)	20.0 (6.1)
-avoidance coping	20.6 (6.7)	21.9 (5.5)	20.0 (5.9)	20.3 (5.3)	19.1 (4.5)	22.0 (1.6)

Appendix 18

**Table 3.8: Means for POMS Subscales at each
Measurement Point**

Table 3.8: Means for POMS subscales at each measurement point

POMS Subscales	Baseline M (S.D.)		Post Intervention M (S.D.)		Follow Up M (S.D.)	
	MBSR (N=30)	Control (N=29)	MBSR (N=26)	Control (N=21)	MBSR (N=22)	Control (N=5)
Tension	19.50 (8.53)	19.62 (7.03)	16.23 (5.36)	20.76 (6.99)	13.59 (6.31)	19.20 (5.89)
Depression	25.70 (13.89)	27.07 (12.69)	21.62 (8.86)	27.00 (10.09)	19.64 (8.44)	23.80 (11.17)
Anger	20.70 (9.83)	19.38 (5.94)	15.81 (4.15)	19.29 (6.26)	15.23 (4.64)	16.40 (1.52)
Vigour	22.30 (7.96)	19.97 (6.42)	25.04 (6.10)	18.86 (6.38)	28.18 (8.12)	19.20 (6.30)
Fatigue	16.97 (7.71)	19.62 (9.02)	12.96 (4.94)	20.57 (8.16)	11.32 (5.45)	18.80 (8.87)
Confusion	16.43 (5.54)	16.52 (4.29)	14.62 (3.96)	16.95 (4.71)	12.45 (3.31)	15.80 (5.07)